University of Alberta

The Development of Policy and Adaptive Management in the Foothills Model Forest

by

Michael A. den Otter ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment

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in

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Oct. 4, 1999

Change is not just a fact of life. It is the very essence of life. To remain relevant and viable, institutions must adapt to the changing environment that is the context of their existence.

Kessler and Salwasser 1995

The day will come when the population of Canada will be ten times as great as it is now, but the national parks ensure that every Canadian ... will still have free access to vast areas possessing some of the finest scenery in Canada, in which the beauty of the landscape is protected from profanation, the natural wild animals, plant and forests preserved, and the peace and solitude of primeval nature retained.

James B. Harkin 1920

And through the night, behind the wheel, the mileage clicking West
I think upon Mackenzie, David Thompson and the rest
Who cracked the mountain ramparts, and did show a path for me
To race the roaring Fraser to the sea.

Stan Rogers 1981

University of Alberta

Faculty of Graduate Studies

The undersigned certify that they have read, and recommended to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled *The Development of Policy and Adaptive Management in the Foothills Model Forest* submitted by Michael A. den Otter in partial fulfillment of the requirements for the degree of Master of Science in Rural Sociology.

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Abstract

Adaptive management is a type of natural resource management that includes anticipating change, feedback and adjustment loops, and rapid learning for managers. The effectiveness of adaptive management is examined in three protected areas of the Foothills Model Forest; Jasper National Park, William A. Switzer Provincial Park and Willmore Wilderness Park. Qualitative evaluation methods are used including personal interviews and document review. Results demonstrate that a region may experience several types of management regimes in its history. Jasper has gone from practicing reactive management to nearly active adaptive management. Switzer has employed a type of passive adaptive management while Willmore has tended to reactive management. Barriers to adaptive management such as lack of agency vision, insufficient policy structure, political power, and bureaucratic complexity prevent the free flow of information in an organization. The Foothills Model Forest may offer some hope in reducing these barriers by bringing together the various agencies.

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List of Abbreviations

CEAC: Canadian Environmental Assessment Act
CFS: Canadian Forest Service
CPAWS: Canadian Parks and Wilderness Society
CWS: Canadian Wildlife Service
EARP: Environmental Assessment and Review Process
FMF: Foothills Model Forest
JNP: Jasper National Park
NPPAC: National and Provincial Parks Association of Canada
NPS: National Parks Service

The Evolution of Policy and Adaptive Management in the Foothills Model Forest

1. INTRODUCTION

1.1. Overview

The management of natural resources has been evolving for many years. When Europeans first arrived on this continent they encountered a landscape that looks quite different than today's. Native North Americans had been living in and tending to the earth through practices that had persisted for generations (Anderson 1996). Europeans, with their technology and conquering spirit, began to exploit the continent's natural resources, dramatically altering these 'natural' systems. As these early societies advanced, there was an increase in uses and pressures on the land. There was timber and game in the forests, minerals in the ground, and aquatic life in the lakes, rivers and oceans. With these pressures came a need to manage the different users of the environment. In Canada, environmental management has a long history of conflict and uncertainty within its various resource sectors (Mitchell 1995). Academics and land managers are continually searching for new ways to address these dilemmas and manage natural resources effectively.

A recent addition to the lexicon of natural resource management is adaptive management. Adaptive management is an evolving concept that has different meanings for different individuals and agencies. The common thread among the different definitions of adaptive management is feedback and adjustment (Bormann et al. 1994). The key to adaptive management is to embrace risk, uncertainty, and active learning in order to break the cycle of the typical reactive management regime. Adaptive managers set goals for their resource base and then actively and formally try to learn from the outcomes and improve subsequent policies (MacDonald et al. 1997). The public is incorporated in the decision process including the advice and expertise of academics, government officials, and industrialists. Adaptive management should increase knowledge acquisition rates, enhance information flow among policy actors, and provide opportunity for creating shared understandings (McLain and Lee 1996).

The Foothills Model Forest (FMF) in Alberta, Canada is interested in determining if the management units in their area have historically and currently been practicing a form of adaptive management. This thesis examines the management history of three protected areas of the FMF; Jasper National Park, Willmore Wilderness Park, and William A. Switzer Provincial Park. The major question asked in this work is if the policy and management framework was sufficiently flexible to permit some type of adaptive management. The goals are to investigate how policy and management developed in these areas, determine if a form of adaptive management was practiced, provide a theoretical framework to help understand policy and management changes and to tell a story of the development of policy and management. It is hoped that after reading this thesis, the reader will appreciate the complexity of managing ecosystems and the difficult decisions that must be made to balance changing social values and diminishing natural places.

1.1.1. Potential Benefits of the Study

Alberta has a rich history of natural resource management with few published accounts of its development. This text will add to the small body of existing literature that deals with the protected areas of west-central Alberta. All effort was made to produce a faithful and accurate account of those who contributed to the development of the protected areas in this part of the province. This study will help current managers by illuminating where we have been in the past. A major component of adaptive management is active learning. Heeding lessons learned in the past can be a valuable tool for today's manager to avoid the same pitfalls others encountered.

Another potential benefit of this study is to shed light on how the different agencies in the Model Forest cooperate and if there are areas where improvements could be made. The flora and fauna of the region have no regard for the political lines drawn on a map. A key component of ecosystem and adaptive management is to break down some of the barriers between resource management agencies to improve management on a landscape scale. The Model Forest itself may have a role in unifying these agencies and improving information flow. No exhaustive list of recommendations and policy implications will be presented because it is unlikely that one study could have this kind of impact or that there are simple answers to management dilemmas. Rather, this study's main benefit is to provide some perspective on where management in this region has been, where it is, and where it might go if the political will exists.

1.1.2. Potential Limitations of the Study

This study cannot be a definitive authority on precisely how management developed and if it was adaptive. Certain details have been selected for presentation, thereby creating the possibility for the omission of key elements. While every effort has been made to check researcher bias, there is always an element of personal opinion that could color the final interpretation. There are many people with authority on these regions that were not interviewed whose opinions could be radically different opinions than those expressed herein. Because the study has a strong historical element that spans nearly one hundred years, there is no certainty that the essence of a period's management history has been effectively captured. It is difficult to reconstruct attitudes and beliefs of an era of people who do not have representatives alive today. In addition, memories of those who did provide details of past events may have faded or changed over the years. Despite these limitations, it is believed that this work is accurate and fair. Researcher biases have been checked concerning management in these areas, findings corroborated with key informants, and attempts made to locate disconfirming evidence.

1.2. Study Site

The Model Forest Network of Canada was created through the Canadian Forest Service "to address the challenge of balancing the extensive range of demands that we place on our forests today and the needs of tomorrow's generations" (Model Forest Network 1998). The network encompasses eleven Model Forests from the Western Newfoundland Model Forest in the east to British Columbia's Long Beach Model Forest (Figure 1.1). Each model forest was created to bring together and form partnerships with industry, government agencies, academics, local communities, protected areas, aboriginal groups, and any other interested parties. A Model Forest provides a forum for dialogue among the various stakeholders and also acts as a laboratory where new approaches to management can be researched, developed, applied, and monitored (Foothills Model

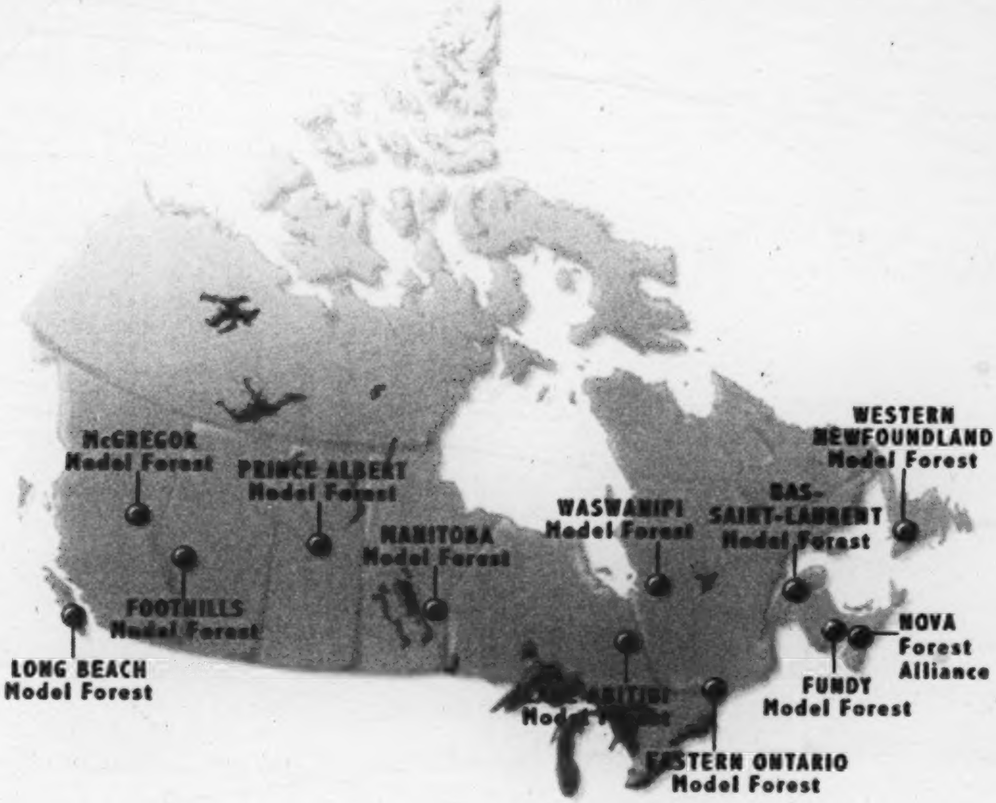
WESTERN NEWFOUNDLAND Model Forest
McGREGOR Model Forest
PRINCE ALBERT Model Forest
WASWANIPI Model Forest
BAS-SAINT-LAURENT Model Forest
MANITOBA Model Forest
FOOTHILLS Model Forest
NOVA Forest Alliance
LONG BEACH Model Forest
ABITIBI Model Forest
FUNDY Model Forest
EASTERN ONTARIO Model Forest

Figure 1.1. Canada's Model Forest Network (Model Forest Network 1999)

Forest Network 1998). A Model Forest has no 'real' authority for management in an area but rather acts as a type of think-tank where research is initiated and stakeholders meet to exchange information and ideas.

The Foothills Model Forest is located in the foothills ecoregion of west-central Alberta, centered around the community of Hinton (Figure 1.2). The major land allocations are the Weldwood of Canada Forest Management Agreement Area, Jasper National Park, Willmore Wilderness Park, and Switzer Provincial Park. The two largest communities in the Model Forest are Hinton and Jasper with 1996 populations of 9,961 and 4,301 respectively (Statistics Canada 1999). The sponsoring partners are the Canadian Forest Service, Parks Canada, Alberta Environmental Protection and Weldwood of Canada (Foothills Model Forest 1998). The Foothills Model Forest is

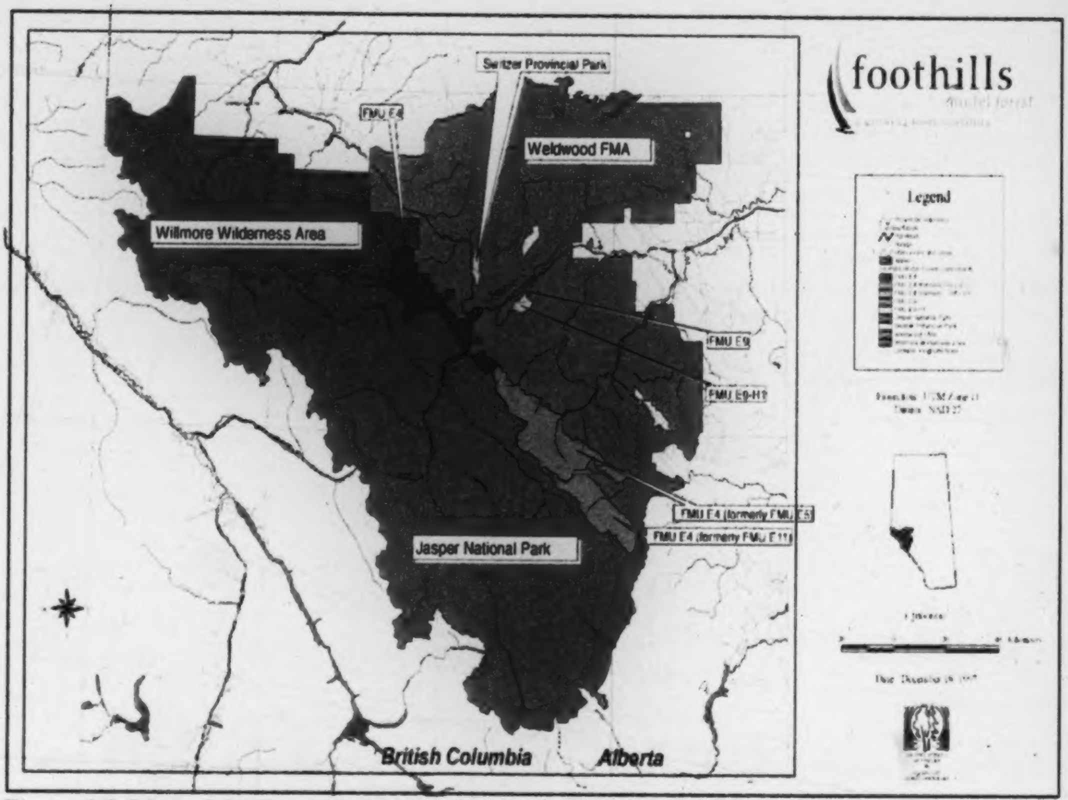
Switzer Provincial Park
FMU E4
Weldwood FMA
Willmore Wilderness Area
FMU E9
FMU E9-H1
FMU E4 (formerly FMU E5)
FMU E4 (formerly FMU E11)
Jasper National Park
British Columbia
Alberta
foothills
model forest
Legend

Figure 1.2. Map of the Foothills Model Forest (Foothills Model Forest 1999)

involved in both ecological and social science projects including studies on wildlife, cumulative effects, landscape disturbance, community sustainability and nontimber values of the forest.

Jasper National Park represents the largest area to be considered in this study with an area of 10,878 km^2 (Foothills Model Forest 1998). Jasper was created in 1907 and is currently being managed by Parks Canada, a division of Canadian Heritage. Jasper National Park is unique among most protected areas in that it has a townsite located within the boundaries of the park. Every year over two million visitors flock to the area which can cause the townsite population to swell to over 20 000 on long weekends (Gadd 1995). Jasper is situated in the mountain ecoregion of Alberta and is rich in wildlife species and scenic beauty that attracts tourists from around the globe (Figure 1.3).

Figure 1.3. Wilcox Pass in Jasper National Park

Visitors have an excellent chance of seeing elk, moose, bighorn sheep, and black bears on expeditions to the park. People also engage in many recreational activities such as hiking, water sports, mountain climbing, cycling, and skiing. As this thesis will demonstrate, the park is under great pressure from both internal and external threats to its biological diversity.

The two other protected areas, Willmore Wilderness Park and William A. Switzer Provincial Park, as well as the Yellowhead corridor, straddle the mountain and foothills ecoregions. Willmore, established in 1958, has a total area of 4,597 km^2 and is operated by the Department of Lands and Forests (Alberta Environmental Protection 1997). The park is quite remote and is accessible to only a few visitors on foot or horseback each year. A voluntary self-registration program in 1998 netted only 274 people other than outfitters using the park, 91% of those from the province of Alberta (McFarlane and Watson 1998). Switzer represents the smallest park in the area with a land-base of 2,688 Ha. The park was established in 1958 and is managed by the Parks Services of Alberta Environmental Protection. It has excellent opportunities for water-based activities such as canoeing and kayaking with five interconnected lakes (McFarlane and Boxal 1998).

The Yellowhead corridor is comprised of several areas within the Model Forest that fall under provincial government jurisdiction such as Folding Mountain, Athabasca Lookout and Entrance.

1.3. Study Approach

The basic purpose of this research project is to evaluate the development of policy and management in the FMF to determine if it has been adaptive. Evaluation research is a set of sociological methods used to asses the consequences of a set of policies, and to measure the extent to which goals and objectives are met (Marshall 1994). In order to do this, one must have a clear set of parameters by which to measure success. The first step in the process was to review the literature and establish a set of criteria that define what it means to manage adaptively. Concurrent with this process, social theory literature was reviewed that might help explain why some organizations are able to manage adaptively while other are not. The next stage was to become familiar with the documented history of each region and produce timelines of policy development. This was accomplished through a review of published literature on areas within the Model Forest and through informal interviews with key informants. From these timelines key turning points were selected to focus the research for the main data collection period. These turning points were times of major policy changes or controversy in the region's history. The goal was not to limit discussion to these turning points but to provide a workable framework for analysis. It is also important to note that these regions have different spheres of management. For example, the management of Jasper National Park has bureaucratic levels within the park but also in Calgary and Ottawa. This work focuses most directly on the management of each specific geographic area but also acknowledges the roles of provincial (Environmental Protection) and national (Parks Canada) agencies.

A period of field work, using qualitative evaluation methods, was undertaken to interview people and locate secondary data sources relating to policy development. Interviews were conducted with people who had knowledge and experience with the different management zones. These informal interviews were done face to face without a strict, structured format. Each respondent was asked a set of questions covering the relevant topics but there was enough flexibility to allow the session to take whatever turns the respondent desired. While in the field, themes emerged from the respondent's interview information that were used to further develop a theoretical framework. In qualitative evaluation research it is considered acceptable to enter the field without a theoretical framework in place and ask questions of respondents in order to use their answers to develop theories (Patton 1990). Using the developing theoretical framework, interviews and secondary sources were analyzed to assess how adaptive the different organizations were. The interpretation of those results constitute the majority of this document.

1.4. Thesis Organization

The main text begins in Chapter 2 with the literature review. The chapter commences with an introduction to the term ecosystem management and the difficulties land managers face in balancing competing interests. This is followed by an in-depth look at a key component of ecosystem management and the main concept of this thesis – adaptive management. A closer examination of protected areas management follows that focuses on the many internal and external forces that can alter the policy agenda. This is further explored in the theoretical framework that outlines the idea of agency capture and how public policy can be dominated by powerful constituencies. Relevant literature from a wide range of disciplines such as rural sociology, geography, and conservation biology is presented. The chapter concludes with a look at the internal workings of organizations and how they might be impeded from practicing adaptive management.

Chapter 3 covers the methods used to collect data. It begins with a look at a definition and overview of the types of evaluation research. This is followed by a more general presentation of qualitative methods and how they may be an appropriate means of investigating social phenomenon. The remainder of the chapter deals with specific methods choices and strategies such as personal interviews and data analysis. The goal is to present a readable account of the real decisions and struggles a researcher faces in gathering data, not a dry discussion of minute details.

The majority of the actual findings are presented in Chapter 4. This chapter is divided into sections dedicated to developing a historical profile of each region. Information is presented through a chronological overview of major changes and periods in the development of the area. This is based on the literature review as well as comments from the interviews. Some initial conclusions are presented on whether management was adaptive or not. This chapter is intended to be mostly descriptive and could be compared to the results section as found in most quantitative studies.

A more thorough discussion of the findings can be found in Chapter 5. This chapter is more analytical than the proceeding chapter as connections are drawn between management of the various regions. Conclusions are presented as to the effectiveness of adaptive management using references to the theoretical framework. The final chapter reviews the major objectives of the project and summarizes the findings. Specific recommendations and policy implications are included as well as suggestions for future research.

2. LITERATURE REVIEW

2.1. Introduction

This section provides background on some of the terms used in natural resource management and in particular, adaptive management. Resource managers have historically used many different terms to reflect the evolution of management styles with new scientific information and changing social values. Some have suggested that the goals of forest management have gone from maximizing timber production, to sustained timber yield, integrated forest management and finally ecosystem management (Aplet et al. 1993). Protected areas management has also undergone many changes. At one time parks were set aside primarily as game reserves to attract tourists and required few management interventions. As more people flocked to these pristine areas, there was an increased emphasis placed on managing users. Today most protected areas managers in Canada are concerned with ecosystem management and maintaining ecological integrity (Dearden and Rollins 1993).

This chapter begins with a look at the concept of ecosystem management and one of its key components; adaptive management. Adaptive management requires taking proactive steps to optimize outcomes in a feedback and adjustment loop. The following section will examine more specifically the adaptive management of protected areas because the management jurisdictions covered by this thesis are all protected areas. It should be remembered that the goal of this thesis is not to potentially indict those in the past for decisions that seem incongruous with today's more environmentally driven decisions. Decisions in the past must be judged by the standards, practices and amassed knowledge of the day.

The final section develops a theoretical framework to help explain the development of management and policy in the Foothills Model Forest and some barriers that might have prevented its application. Through the interview process, it became apparent that many forces have influenced the direction of management in each of the jurisdictions. In this section some theories are explored as to how agencies can be 'captured' by powerful constituencies who dominate the policy agenda. Specific examples and literature are presented from protected areas management to illustrate the theoretical framework. In addition, theories of agency culture and bureaucratic slippage are presented to illustrate how policy objectives can be altered and how adaptive management can be impeded.

2.2. Ecosystem Management

Modern land managers deal with many troublesome issues when they try to balance the different uses of the land with the biological requirements of ecosystems. Allen and Gould (1986) distinguished between what they termed complex and wicked problems. Land managers are accustomed to dealing with what they consider complex ecological problems that can be solved by the application of formulas and equations to arrive at an optimal solution. For example, a forester may be able to determine the best cutting and regeneration methods to optimize timber yield in a certain type of stand. Wicked problems are not so straightforward. There is no single solution to these problems, no true or false but rather a range of good or bad outcomes. Wicked problems are complicated by human values that may run contrary to what appears to be a 'rational' choice (Allen and Gould 1986). Different members of society may have greatly conflicting views on how the land should be managed and for whose benefit. Allen and Gould note that most problems facing land managers today are wicked. Where once a forester may only have to consider ecological variables when maximizing timber yields, there are now other users and values for the forest. Humans and human values are what make these problems wicked and humans are the ones to solve them.

One framework to deal with these types of wicked problems is ecosystem management. Parks Canada has adopted this management philosophy as its mandate for administrating the national parks (Parks Canada 1998). Many other resource managers claim to perform ecosystem management although the definition of the term is often unclear. Grumbine (1994:31) performed a literature review to identify common themes among various authors' use of the term to produce a working definition. From these themes he arrived at the following definition: *Ecosystem management integrates scientific knowledge of ecological relationships within a complex sociopolitical and values framework toward the general goal of protecting native ecosystem integrity over* *the long term* (Grumbine 1994). One of the key themes identified in this work was the need for adaptive management. Because ecosystems are dynamic and constantly in a state of change and renewal, a flexible approach is required to address uncertainty. New scientific and social research must be continually incorporated into management plans to most effectively adapt to changing conditions. Ecosystem managers must define goals for what they want to accomplish and to anticipate changes in values, politics, and biological knowledge in attempting to make the best policy choices (Agee and Johnson 1988).

2.3. Adaptive Management

Adaptive management has been proposed as a system to optimize the use of natural resources in the face of uncertainty by treating management as an experiment. The term, like ecosystem management, has different meanings to different people. It first appeared in the literature in works by Holling (1978) and Walters (1986). These original works propose to more closely link management and research by changing the piecemeal approach to gathering data. Managers have traditionally gathered information by examining various components of the ecosystem and then integrating them to provide direction for policy. Once these policies are in place, they are infrequently changed except perhaps for minor alterations. The status quo is maintained. Under an adaptive management regime, managers would continually monitor the results of their decisions and seek ways to improve them by searching for other policy directions. They would not be afraid to take calculated risks in order to improve production but would rather view risk as an opportunity to increase yield (Walters 1986). Policy is regarded as one simple experiment with a continual potential for learning. Adaptive management is a way of planning for unanticipated outcomes by gathering information from every possible source. Often the most surprising outcomes provide the greatest opportunity for learning (Lee 1993).

More recently, the definition of adaptive management has changed to reflect more broadly defined management goals. For example Haney and Power (1996:879) define it as “a heuristic process coupling science and social values to promote the sustainable management of natural systems.” The President’s Forest Plan in the United States claims that it is "based on a continuing process of action based on planning, monitoring, evaluation, and adjustment" (Forest Ecosystem Management Assessment Team (FEMAT) 1993:VIII-5). Feedback and adjustment are key in both the social and ecological dimensions of management and are incorporated in almost all definitions of adaptive management. Figure 2.1 illustrates the resulting adaptive management cycle (Bormann et al. 1994). The first step is to arrive at a plan based on clearly defined goals using the best knowledge and technology available. This plan is then put into action with constant monitoring and evaluation. Feedback comes not only from scientists but also through effective public participation. Alternative management schemes arise from the feedback generated by the process that in turn creates new initiatives and therefore new plans. Adaptive management should reduce the time needed to fix problems with a policy because it promotes 'rapid learning' (Bormann et al. 1994). Problems are recognized quickly and even risky alternatives may be implemented. This differs from 'reactive learning' which is the traditional method of changing only after lengthy and formal reviews.

There is a strong emphasis on social values and processes in many definitions of adaptive management. It is recognized that societies, like ecosystems, are continually evolving and that management must be adaptive to those processes as well (Haney and Power 1996). The framework of adaptive management seeks to incorporate societal

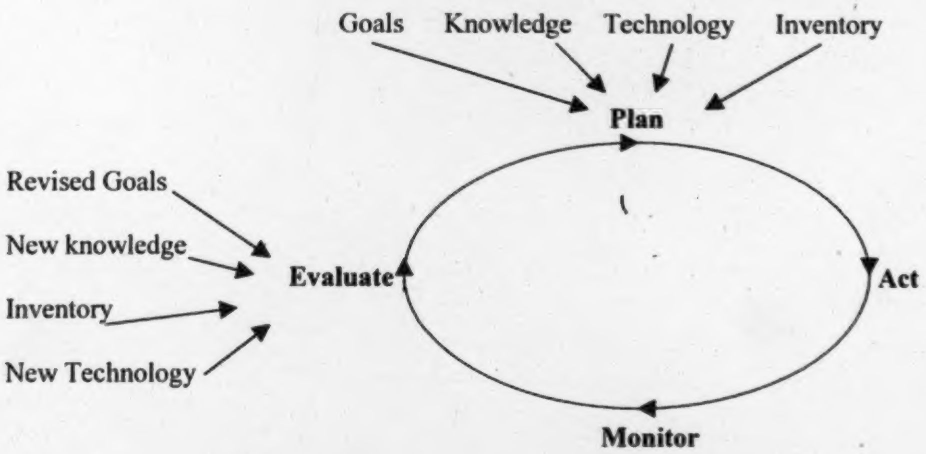

Figure 2.1. The adaptive management cycle (Bormann et al., 1994)

values directly into the planning stage because without public support, policy directives will be more likely to fail. Mclain and Lee (1996), based on their review of the concept, state that adaptive management should increase knowledge acquisition, facilitate information flow, and promote shared understanding among stakeholders. Information flow is aided by the feedback mechanisms built into the system which in turn leads to shared understanding because the various stakeholders must communicate and work together to try to reach consensus. Mclain and Lee analyzed policy and management in three areas where this approach had been implemented using as their criteria of adaptive management, knowledge acquisition, information flow, and shared understandings. Their results showed that these criteria are not always improved as interagency politics can impede effective management.

There have been other examples in the literature of attempts to apply the principles of adaptive management to real world settings. Lee and Lawrence (1986) examined the application and results of an adaptive management regime in the Columbia River Basin Fish and Wildlife Program. In a study of forestry practices, Baskerville (1985) suggests methods of introducing a feedback loop into the control of wood supply. Other researchers have attempted to use computer modeling in order to better manage wildlife resources, for example the Northern Goshawk (*Accipiter gentilis*) (Dewhurst et al. 1995). There still remains a lack of evidence as to the effectiveness of adaptive management. There have not been enough agencies attempting to follow this regime to fully understand how this management method might work. Adaptive management remains a popular concept as witnessed by the attempt of the Ontario Ministry of Natural Resources to adopt this approach for forest management (MacDonald et al. 1997).

2.3.1. Types of Adaptive Management

Holling and Walters' original works on adaptive management are both prescriptive and detailed in their use of statistical procedures. They view adaptive management as a strategy to be implemented and followed with the use of mathematical models. It would be impossible to analyze historical management of the FMF by these adaptive management criteria because this type of management scheme has not be in place. In a joint work, these authors provide a more useful framework for the purposes of this study. They identify three ways to structure management as an adaptive process: evolutionary or 'trial and error,' passive adaptive, and active adaptive (Walters and Holling 1990). These categories correspond closely to those types of adaptive management as outlined by MacDonald et al. (1997); reactive, passive and active (Figure 2.2). These categories, as described below, are used throughout this thesis to categorize what type of adaptive management, if any, has taken place in the Foothills Model Forest.

Under a reactive approach to adaptive management, feedback comes from factors external to the management system such as politics, lawsuits and public reaction

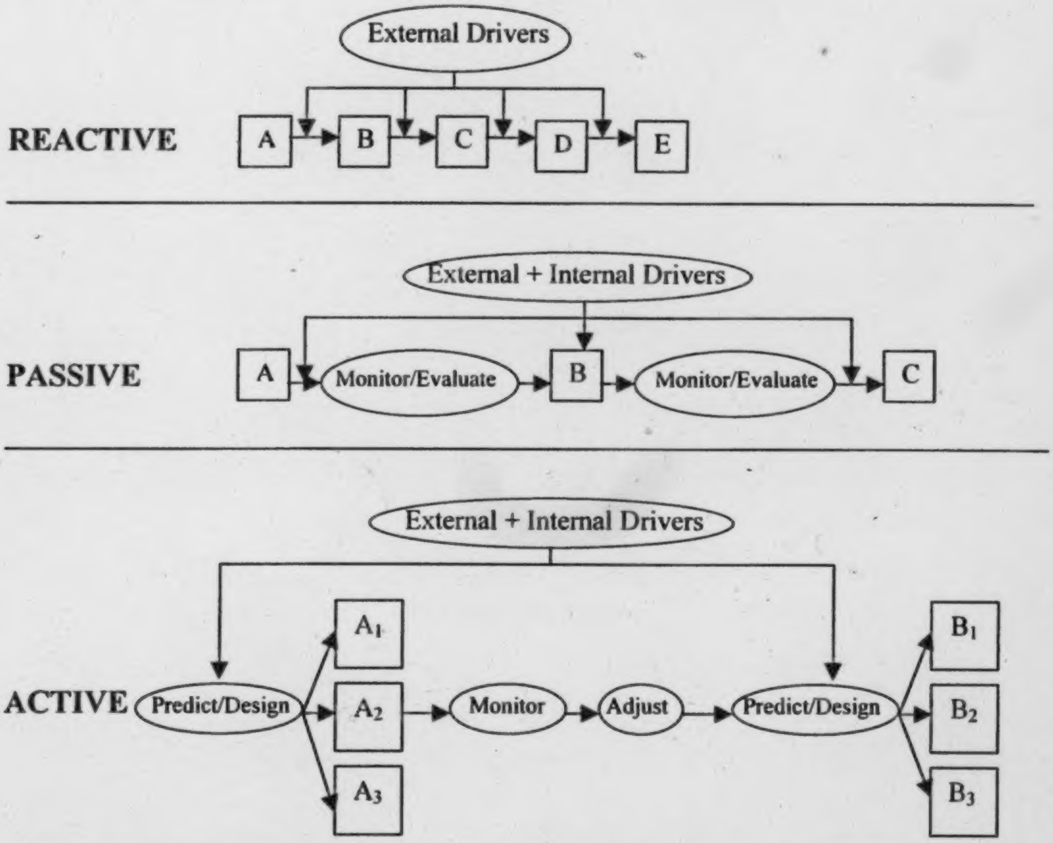
External Drivers
REACTIVE
A
B
C
D
E
External + Internal Drivers
PASSIVE
A
Monitor/Evaluate
B
Monitor/Evaluate
C
External + Internal Drivers
ACTIVE
Predict/Design
A_1
A_2
A_3
Monitor
Adjust
Predict/Design
B_1
B_2
B_3

Figure 2.2. The three types of adaptive management (MacDonald et al., 1997). Each different letter represents a decision making period while subscripts represent different possible policy options.

(MacDonald et al. 1997). This approach is considered adaptive because there is still a feedback-adjustment mechanism, although it is not proactive. Managers would at first make haphazard choices and then choose from outcomes that proved most successful or the least controversial in the public eye (Walters and Holling 1990). There is no real attempt to anticipate change within the system but rather the focus is on reacting to outside pressures.

Passive adaptive management uses historical data to construct a single best model that is from which policy directions would be established. Managers can learn from this model by clearly articulating the goals of the program and then monitoring the results. Scientists and other members of the public may voice their opinions and be incorporated in the design and implementation of a monitoring plan. This approach has been criticized because it may fail to uncover different strategies that could demonstrate better alternatives. There is also the potential that this strategy will revert to a reactive one when commitment and funding for monitoring wanes.

The active adaptive management approach should improve on the passive technique by using all available data to construct a range of alternate response models. Rather then being limited to one policy, the active adaptive manager has a suite of policies and practices that can be compared in management experiments (MacDonald et al. 1997). Policy is designed to best reflect the model that maximizes short and long-term objectives (Walters and Holling 1990). There should be a continual collaboration between scientists, resource managers, industry and public stakeholders. Policy can be altered as new information becomes available through constant monitoring of social and biological conditions. Lautenschlager (1996) argues for a predictive adaptive management that embodies the ideals of an active adaptive system. It requires addressing regional and local concerns to identify management goals and to attempt to manage ecosystems even in the absence of complete information.

Any type of adaptive management must still deal with complex issues such as balancing human values and defining who benefits from resource use. Even when an active adaptive management system is in place, these questions may not be adequately addressed because of complex social and political factors. In addition, active adaptive management may not be the best alternative for every organization. A reactive approach may be more effective because of various constraints or circumstances facing the agency.

2.3.2. Summary of Adaptive Management

The preceding section illustrated the range of meanings and categories that can apply to adaptive management. The following list condenses these meanings into a series of criteria, presented in question format. These questions were used throughout the research process and in personal interviews to analyze if policy and management were adaptive in the FMF.

- Were many options identified at the time of a major decision?
- Was there room for feedback and adjustment?
- Were predictive models used?
- What was the quality of monitoring?
- Was the system flexible and reactive enough to permit rapid change from new learning?
- Were risky or experimental options considered?
- Did the framework incorporate public participation at every stage of planning, implementation and monitoring?
- Was there good information flow between researchers, policy makers, and the public?
- Was there an attempt to manage at an ecosystem level, even with insufficient information?
- Were shared understandings created as a result?
- Were there attempts to link academic, government, societal and industry perspectives?
- What type of adaptive management (reactive, passive, or active), if any, was practiced?

2.4. Theoretical Framework

Developing a theoretical framework for this thesis proved difficult due to the lack of literature dealing with the social science of protected areas management. Very little theory exists to explain the implementation and application of policy in natural resources management in general (Wallace et al. 1995). The biggest challenge was finding an appropriate level of analysis and importing theory that would help explain what institutional factors are required for adaptive management. The basic questions asked in this thesis were what conditions must be met to have an adaptive organization and what might impede this from happening. De Greene (1982) succinctly describes the ideal adaptive organization:

> An adaptive organization must be flexible and resilient, open to ideas and perceptions from without, keep an eye on the present and likely future environmental changes, learn from experience, and be quick in response. Yet much organizational planning rejects the very features necessary for viability and survival.

Organizations are not adaptive if they are not open to new ideas, are captured by only one perspective, or cannot effectively respond to change due to bureaucratic constraints.

Ecosystem and adaptive management are often impossible to achieve because they are constrained by rigid institutional structures (Cortner et al. 1996). Natural resource agencies, like any bureaucracy, can become bogged down in red-tape that prohibits quick feedback and adjustment. The rules, procedures and routines of organizations have been shown to act as barriers to learning and adaptive management (MacDonald et al. 1997). Adaptive management has also failed because managers refused to take into account different world views and personal knowledge of local residents (Stankey and Shindler 1997). When managers are strongly influenced by only one perspective they cannot respond to the diverse interests of park stakeholders or complex ecological processes. The following section describes how managers of protected areas are influenced by different forces and provides an example of how Parks Canada has been 'penetrated' by interest groups. It is important to realize that much of this research focusses on national parks and does necessarily reflect the situation in Alberta's Provincial Parks. Differences may be expected as provincial governments have been shown to more jealously guard their natural resources due to their importance to generating revenue for the province (Cairns 1992).

2.4.1. Politics in Protected Areas

The term protected areas, like most other terms in natural resource management, appears to have many different meanings. In general, protected areas can be thought of as places that are designated by legislation to ensure the protection of flora and fauna within their natural habitat (Canadian Environmental Advisory Council 1991). Parks perform several ecological functions such as preserving genetic diversity, maintaining benchmark protection, conserving critical ecological processes and protecting unique features (Eagles 1993). Parks also provide recreational, economic, cultural and spiritual benefits to individuals and societies (Canadian Environmental Advisory Council 1991). It is precisely this range of possible benefits that make managing parks a contentious dilemma because many of the uses are incompatible. The most enduring debate in protected areas management revolves around the 'dual mandate' of parks; should they be preserved for future generations or used for people's enjoyment today (Rollins 1993).

Freemuth (1989:285) states that "national park policy continues to be decided in the political arena. The parks mean too many things to too many different groups and individuals to expect that this should be otherwise." To illustrate the different influences of parks policy he designed a conceptual model based on the American National Parks Service (NPS). In this model he hypothesizes that policy is determined on two continuums; expert vs. political control over policy and ethics of use vs. preservation (Figure 2.3). The expert/political dimension separates those who feel management should be controlled by experts such as scientists, academics, and park managers with those believe that politicians should direct policy. The preserve unimpaired/provide enjoyment variable represents the dilemma of the 'dual mandate' of national parks. Are protected areas for the benefit of the ecosystem and future generations (preservation) or for people to recreate in and enjoy (use).

In Freemuth's study, he found that most park professionals are found in Cell II. They believe in preserving the parks for ecosystem benefits and they feel that they posses the necessary skills to do it. Local communities and governments (Cell IV)

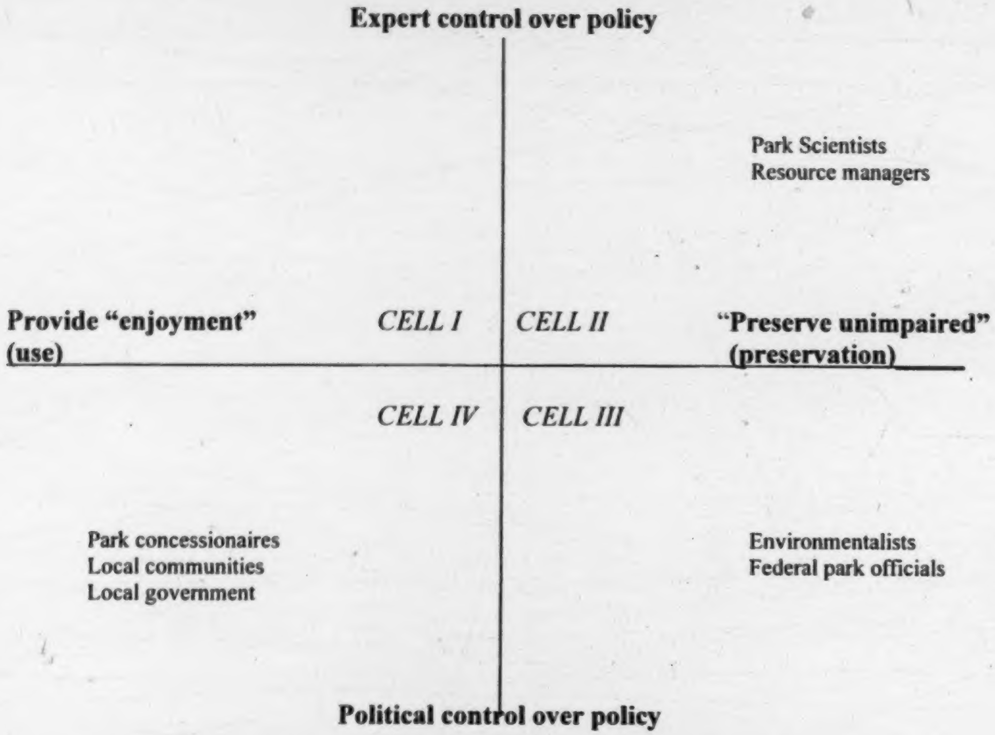
Expert control over policy
Park Scientists
Resource managers
Provide "enjoyment" (use)
CELL I
CELL II
"Preserve unimpaired" (preservation)
CELL IV
CELL III
Park concessionaires
Local communities
Local government
Environmentalists
Federal park officials
Political control over policy

Figure 2.3. National park policy continuums; based on Freemuth's (1989) American example.

are the opposite in that they want to use the park for economic benefits and want politicians to direct policy. With governmental control, they have a better chance of applying political pressure to ensure favorable outcomes. Environmentalists, in his example, are generally represented in Cell III where politicians have control over the resource with a management philosophy that emphasizes preserving the park. To manage a park adaptively, it is necessary to define an achievable management goal and to listen to many different voices and perspectives. This model demonstrates how difficult it is to set goals when there are such different philosophies of management. It also highlights how the various stakeholders can meet in conflict because their belief systems are so contradictory. As Freemuth (1989:284) states, what remains to be seen is whether the park agency "has great autonomy in its decisions or whether it is subject to extensive external control."

Dearden and Berg (1993) propose that in Canada there has been extensive external control of Parks Canada by several interests. In their model of administrative penetration, they propose that three different groups, entrepreneurs, environmentalists, and aboriginal peoples have at different times greatly influenced Parks Canada policy. These periods are illustrated in Figure 2.4. Business interests were first able to dominate because the national park system in Canada was originally created to entice tourists and support the developing railway (Lothian 1987). In the early years of Parks, corporate interests were accommodated with the issue of logging and coal mining permits. There was some interest in environmental issues in the early years but this did not really become significant until the 1950s. Environmental groups finally 'penetrated' Parks Canada in 1971 and proved more powerful than business interests by protesting and eventually blocking the expansion of the Lake Louise ski area. In the final and current phase, Parks Canada is captured mainly by aboriginal groups that have significant influence in the creation and management of new parks (Dearden and Berg 1993). There is a recognition among park managers and the public in general of the disproportionate

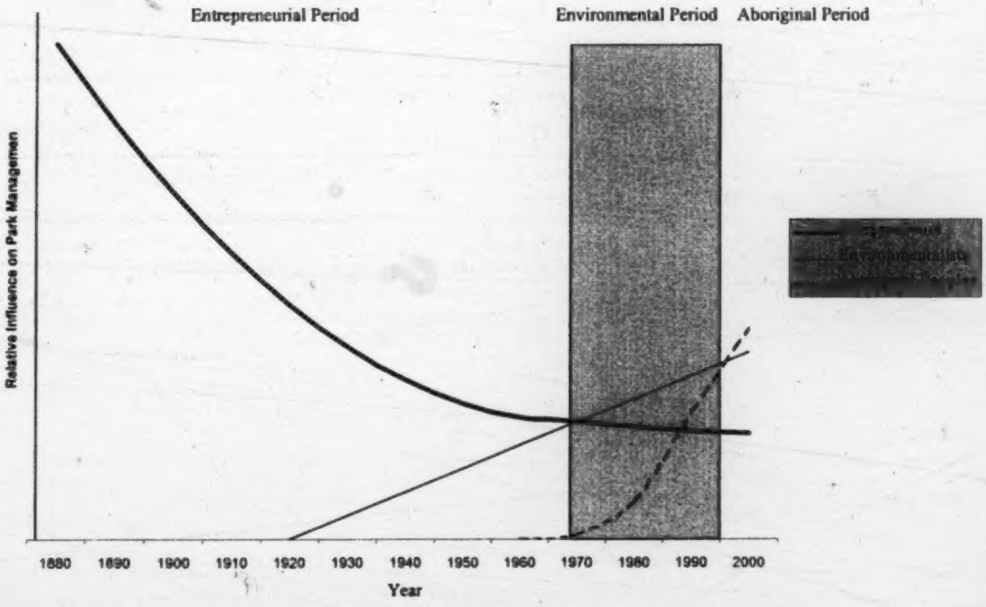

Figure 2.4. Administrative penetration model (Dearden and Berg, 1993)

impacts of protected areas on the native community (Morrison 1997). Aboriginal peoples have a fundamentally different view of nature and use the landscape differently, a concept that Parks Canada is attempting to incorporate in resource planning.

This model supports the idea that national parks managers are susceptible to influence by external forces. Under an adaptive management regime this can actually be a desirable thing. Adaptive managers need to consider the opinions and views of those affected by management decisions. A problem could arise however if only one group is able to dominate the policy agenda. Dearden and Berg (1993) note that while the influence of these groups may be seen to dilute the decision-making power of Parks Canada, the overall effect may be beneficial by increasing input from outside park boundaries.

2.4.2. Agency Autonomy

The study of organizations and autonomy owes much of its legacy to the work of Max Weber (Ray and Reed 1994). Weber's concept of the ideal type of bureaucracy and the state (Weber 1997) have had a great influence on the discourse of agency autonomy. According to Manring (1994:199) autonomy for public officials "means the ability to exercise their professional discretion in making decisions within their delegated spheres of authority." For example, the bureaucrat responsible for land management in a province must be able to allocate permits freely based on what they are legislated to do. He or she cannot be overly constrained by other government officials, industry demands, or public lobbying. While various stakeholders may have their voices heard, the official should be able to make autonomous decisions based on what is best for society as a whole. Of course many public officials make decisions based on what is best for themselves or a specific interest group. Sabatier (1975:302) states that some public resource management agencies have "become dominated after a period of time by the very economic interests they are supposedly regulating." In other words, the organization is *captured* by one group which dominates the agency's policy agenda.

Agency autonomy and agency capture are well developed concepts in the sociological literature that mirror Dearden and Berg's (1993) and Freemuth's (1989) conceptions of political influence in national park management. Both state and organizational theorists have commented on the relationship between an agency and its constituency. State theorists, for example, have written extensively on such topics as the role of capitalism, economics, rationality, symbolism, public policy, and democracy on the development of the state and its relationship to the public (Block 1987; Lindberg et al. 1975; O'Connor 1973). Much empirical work on capture theory is actually focused on natural resource agencies and in particular regulatory agencies such as forestry, oil and gas, and agriculture. One would expect protected areas to have a very different set of agency – constituent relations as the regulated body are the users of parks and society in general. What follows is an overview of the basic model of agency capture followed by a section on the relative merits of agency autonomy and forms of domination by strong constituents.

State theorists are generally divided into two camps based on their view of government-society relations; society-centered and state-centered (Hooks 1990). Society-centered theorists present a Marxist view where the state is a servant of the ruling class. Policy is decided in a public forum by interest groups but one set of interests tend to dominate the policy agenda. Change will occur only when there is a shifting balance of power in society based on who can control the allocation of resources (Hooks 1990). In contrast, the state-centered view makes the claim that states are powerful and can maintain autonomy from the capitalist class (Glenna 1999). Policy is determined by state officials and changes result from altering power balances within the state.

Patrick West (1994) reiterates the analysis of Hooks but discusses comparable perspectives from organization theory and includes a third notion of state – society relations. West demonstrates that the society-centered view is mirrored in organizational analysis by the institutional school while the state-centered view is termed the bureaucratic autonomy school. He also argues for the existence of a third perspective termed the contingency or relational school (West 1994). In this framework, the degree to which external domination can occur is dependent on the relative power balance between the bureaucracy and the constituency. If an agency is powerful they are able to resist external domination but if they are weak, they will be captured by those interests (Perrow 1986). This school most closely captures Weber's view of the state and bureaucracy. Weber believed it critical to examine the historical development of an agency because relative power balances change over time and place (West 1994). An agency can have complete autonomy over decision-making at one period in its existence but can lose that autonomy if its power base is weakened.

What then are the implications of agency autonomy and domination to adaptive management? Katz (1968) suggests that agencies require autonomy to adapt to their environment and have strong internal controls. Autonomous states can implement policy at will and take a strong position on their mandate (Hooks 1990). On the other hand, completely autonomous states "would lack sources of intelligence" and "leave the state incapable of resolving 'collective action' problems, of transcending the individual interests of its private counterparts" (Evans 1995). Manring (1994) examined the role of the external environment on bureaucratic autonomy in the USDA Forest Service. She found that Forest Service employees discovered the necessity of maintaining professional autonomy by engaging in meaningful negotiations with its constituents. The real measure of success and autonomy for the agency was in being able to get things done by adapting to the needs of the public and industry. What is not desirable is when only one external force dominates the policy agenda through the exercise of power. Thus it appears that a contingent autonomy where agencies respond to all its constituents is most desirable for adaptive management.

External constituents can come to dominate a regulatory agency in many ways. Domination is an imbalance of power that greatly influences social action (McNeil 1978) and can work through many specific channels in an organization. Over a period of time, more than one external force could dominate a natural resource agency by using a number of different means. West (1994) describes five types of domination that are outlined in Table 2.2. The first three forms all rest on some type of power sanctions by the external force. *External sanctions* involve a constituent applying some kind of direct threat to the agency. An example is a mining company that threatens to shut down operations if the government refuses to lower environmental standards. *Informal cooptation* occurs when an agency internally decides to grant power to an external constituency without publicly declaring this fact. This corresponds to the often heard complaint that some government agencies are merely mouthpieces for certain industries.

Table 2.1. Forms of domination (West 1994)

Domination by…	Description
External sanctions	Exertion of external power, usually as threats, and if necessary carrying out those threats; more like Weber's concept of power then domination.
Informal Cooptation	Granting real power to external constituency without recognizing responsibility; gives external force an inside track without publicity.
Power-sharing formal cooptation	Sharing of responsibility and perhaps power; example is formal advisory boards where powerful local interests can dominate.
Constellation of ideas	Influence gained by resource control; those with the greatest resources can dominate others by their need for them.
Cooperative domination	This occurs when the interests of the bureaucracy are in line with external pressures and they work together in their domination.

When public advisory boards are given real power to make decisions there is the possibility for *power-sharing formal cooptation*. In this case an external constituent is given real power and can come to dominate the policy agenda. The fourth form, *domination through constellation of interests*, occurs when an actor controls a limited resource and can therefore dominate those who wish to obtain it. Resources need not mean only natural resources but can include such things as financial assets or monopolized skills. The final form, *cooperative domination*, implies that an external constituent holds similar views to those that are pervasive within the regulatory agency and can share domination of certain policy outcomes. An example would be an environmental group who are aligned with the conservation ethic espoused by the managers of a protected area and are thereby able to influence the policy agenda.

2.4.3. Internal Institutional Barriers

The majority of this chapter focused on external impediments to adaptive management but there are also threats that can come from within an organization. Many natural resource agencies have had difficulty transforming themselves into adaptive organizations that practice ecosystem management because organizational change is very difficult to produce (Kessler and Salwasser 1995). The forms of domination as described by Patrick West can occur within an organization as well as from without. Individuals can use power to advance personal interests that are not in line with those of the agency. Weber's (1997) famous description of the ideal bureaucracy includes elements such as advancement based on a meritocracy, tenure, rules and regulations to govern behavior, a hierarchy of responsibility, and specialization of resources. These things should promote efficiency within a system and minimize the ability of individuals to impede organizational goals. However this does not always occur as people use their position for personal gain that erodes the agency's effectiveness. Weber also warned of the 'iron cage' of bureaucracy where the increased rationality and specialization of resources turned people into cogs in a wheel (Clegg 1990). Behavior of people in organizations can get locked into patterns of rules and norms that impede rapid learning and reaction to change.

One form of failure in internal agency vigilance is a though a process called bureaucratic slippage. Freudenberg and Gramling (1994) used this term to describe the successive watering down of public policy until it becomes unrecognizable from what was originally intended. The authors argue that agency capture is rarely a matter of total domination but rather involves a slow reinterpretation of agency ideals. If a management concern arises and an agency requires a new policy, there is usually a period of discussion followed by the formation of a broad policy statement or guiding principle. As the policy moves toward implementation, forces within the organization seek to whittle away the strength of an idea to suit their personal construction of how the policy should look (Freudenburg and Gramling 1994). Each individual in a natural resource organization may have fundamentally different social constructions of the landscape and how to manage it (Greider and Garkovich 1994). These constructions will affect the look of the final policy upon implementation. The process of slippage can work both up and down through the hierarchy of an organization. Good policy decisions that originate on the ground-level can be watered down as they move up through the chain of command when people with vested interest shape the policy to meet their needs. This has led some to argue that the adaptive organization must have greater political decentralization and local autonomy to respond to fast-shifting environmental conditions (Toffler 1985).

Another institutional barrier to adaptive management can occur when the culture of an organization insulates it from outside input. The rules and norms of an agency can lock people into certain modes of thinking and behavior that prevent them from being receptive to new information and feedback from the system. Vandlik (1995) found this to be true in the USDA Forest Service. The organization was composed of people with similar educational backgrounds and professional experiences. Coupled with the agency's strong internal controls, there was a group mentality and narrow way of thinking in the organization. Employment possibilities were limited outside the Forest Service which created a virtual monopoly of opportunities for people with a forestry interest. A hierarchy developed based more on rank than responsibility and performance. These factors led the agency to manage based on the internal values of the organization rather than looking outward to society's interests (Vandlik 1995). The internal politics of an organization can be a powerful impediment to flexible, adaptive management.

Haas (1992:3) developed the concept of an epistemic community to demonstrate how a group of like-minded people can greatly influence policy decision-making. He states that "an epistemic community is a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy relevant knowledge within that domain or issue-area." This network has a shared set of normative and causal beliefs, similar notions of scientific validity and a common policy enterprise (Haas 1992). An epistemic community can have a disproportionate influence on policy development because their common views afford them a significant influence. For example, a groups of scientists in an organization that are tightly banded together can show compelling evidence of a problem even if the rest of the agency does not perceive the issue in the same way. This effect can be especially present in the case of interagency cooperation (Thomas 1997). Ecologists have long recognized the need to manage on a landscape scale because ecosystem boundaries cross political lines. Thomas (1997) demonstrated that when the Endangered Species Act was passed in the United States, higher level managers felt a loss of autonomy because the Act required looking beyond their own management jurisdiction. These managers had to rely on input from the epistemic community of scientists who thereby received more political power.

Power can play a significant role in the functioning of an organization. Power is classically defined as the probability of an actor carrying out their will even when opposed by others (Marshall 1994). Ideally power in organizations should come from the ability to perform tasks but this is not always the case (Pfeffer 1981). Individuals in an organization may use power in many ways to further their own status and advantage rather than the good of the agency. People acquire power by providing or controlling essential resources, being able to cope with uncertainty, being irreplaceable, affecting the decision process, and employing good political skills (Pfeffer 1981). This thesis focusses more on the existence of power in the organization and where it is situated rather than with a specific individual's power. Weber believed that the ideal type of rational-legal domination within a bureaucracy would grant authority to the position a person occupied, not the individual themselves (Craib 1997). This is an important distinction because it shows the need for power to go with a position in an organization and not with the individual who happens to be occupying that post. An organization will have difficulty being adaptive if there is a significant power shift every time an employee changes position.

2.5. Summary

This chapter has reviewed various concepts associated with the adaptive management of natural resources in protected areas. An adaptive approach to management requires a flexible strategy to complete a feedback and adjustment loop. Management in protected areas is complicated by the politics of determining value; are parks for ecological protection, human enjoyment, or some combination of both? In trying to implement adaptive management in protected areas, managers face many obstacles because natural resource agencies deal with both external and internal pressures. External forces are sometimes able to penetrate the agency and capture the policy agenda. This prevents the fair exchange of information and a domination of policy decisions by one group. An agency with absolute autonomy is not desirable either because it may manage resources from the narrow scope of the shared values in the organization. Internal forces such as bureaucratic slippage, agency culture, and power imbalances may also effect an organization's ability to manage adaptively.

3. METHODS

3.1. Introduction

There have been many competing ideas concerning the proper method of social inquiry and whether such a task is even possible. In recent decades, sociologists have focussed the debate on the relative merits of quantitative versus qualitative research. Both camps are often seen to be grounded in different ontological and epistemological roots as each embraces a seemingly different paradigm (Guba 1990a). Sociologists wishing to discover truths about modern society are confronted with a dizzying array of choices to make; qualitative versus quantitative, inductive or deductive theories, participant or observer.

The philosophy of research adhered to in this thesis is that one must first ask a question and then find the most appropriate way to answer it. The main question asked is how adaptable are the various policies, organizations, and managers. The ultimate goal is to attempt to distinguish what has or has not been successful or in other words to evaluate (Verdung 1997). In this process, many decisions had to be made concerning the best way to achieve this goal. This chapter will not burden the reader with a lengthy and detailed defense of every one of these method choices or the philosophy in which they are grounded. Rather, the goal is to provide a sense of the real challenges faced while undertaking the process of data collection. This chapter will first provide the reader with an overview of evaluation research and the different ways of approaching this method. This will be followed by a brief explanation of the logic of qualitative research. The remainder of the chapter will focus on specific issues encountered in the field such as sampling, ethics and reliability/validity.

3.2. Evaluation Research

Evaluation research is defined as "the systematic application of social research procedures for assessing the conceptualization, design, implementation, and utility of social intervention programs" (Rossi and Freeman 1993). It provides a method for carefully examining public policy or social programs to determine how effective they have been. There are practitioners of evaluation from many different disciplines including political science, medicine, policy analysis, education, and sociology. There has not, however, been extensive evaluation research performed in the field of natural resource policy. Wallace et al. (1995) reviewed the literature and discovered that the disciplinary journals are concerned with theory and process whereas the natural resource journals are usually more applied. Because of the diverse range in policies and programs, evaluators from different fields have necessarily employed a wide range of social research methods to investigate their subject. Therefore, there exists no universal approach that can be taken to study the development of policy but rather a host of flexible strategies. Each evaluation is unique and many designs could be employed, though none can be perfect (Cronbach 1982).

One of the most distinctive characteristics of evaluation research is its political nature, a point widely explored in the literature (Greene 1994; Patton 1997; Weiss 1972). Evaluations often investigate policies that are in the public domain which brings in a broad range of stakeholders with vested interests in the evaluation. The sponsoring agency funding the research has a particularly strong interest in the work and may try to influence the findings. Even the selection of criteria on which to base the evaluation has a political component. Different stakeholders may have contradicting opinions on the standards by which the policy should be judged. The researcher must be aware that evaluation is "integrally intertwined with political decision making about societal priorities, resource allocation, and power" (Greene, 1994:531). This study, like any evaluation, has its political context. The criteria for evaluation, the principles of adaptive management, have been selected by the funding agency. The main subjects of the study, national and provincial government agencies, are inherently political organizations that may present a biased agenda. To allay these concerns, every effort was made to provide a forum for all interested parties to voice their views in order to paint an accurate, well-balanced picture. This thesis also goes beyond the basic requirements of evaluation to tell a larger story about the evolution of policy and management in Foothills Model Forest.

3.3. Types of Evaluation

Greene (1994) provides an overview of four major approaches to program evaluation:

1. *Postpositivism*: This has been the historically dominant approach which utilizes systems theory to promote efficiency and accountability. Quantitative methods are preferred including experiments and casual modeling. These evaluations are generally performed for high-level policy and decision makers.
2. *Pragmatism*: This philosophical stance is oriented more toward mid-level program mangers and administrators. It promotes values of practicality and utility in methods and in outcomes. The methods are eclectic and flexible with each different evaluation and can include structured and unstructured surveys, questionnaires, interviews, and observations.
3. *Interpretivism*: This approach is the traditional domain of qualitative methodology using case studies, interviews, and document review. It promotes pluralism and understanding by acknowledging the different values of stakeholders. These evaluations are directed to program directors and beneficiaries.
4. *Critical, normative science*: Feminist, neo-Marxist, and critical theorists have developed this type of evaluation to prompt social action and change. They use participatory methods to include the 'powerless' directly in the research.

The research process in this thesis employs a combination of the pragmatic and interpretivist approaches. Part of the research is utilization focussed, in that very specific questions were asked by the project leaders. The criteria of adaptive management were established[1] and a pragmatic selection of appropriate methods was required to evaluate management based on those criteria. In addition, there is a story to be told based on the accounts of the many different stakeholders who helped influence and shape the current management framework in these parks. To fully appreciate their contributions, an interpretivist approach becomes necessary. Both of these approaches employ qualitative methods in the form of case studies with interviews, observations, and document review (Greene 1994). Michael Patton (1997; 1990) is an important exemplar for this type of evaluation. He encourages using as many different methods as possible to achieve the desired results.

3.4. Qualitative Methods

Sociologists have debated the relative merits of qualitative versus quantitative methods for years. Historically, quantitative methods have dominated investigations of social issues. Researchers use systematic observation and experimentation to seek knowledge of laws of co-existence but often fall short in revealing deeper meanings (Marshall 1994). Qualitative methods were born from an interpretivist epistemology that seeks to collect and analyze data with an emphasis on understanding. Researchers using qualitative methods do not begin with a hypothesis, create a survey, and perform statistical analysis on the collected data. Rather, they enter the field of their study group, listen directly to the people and observe firsthand their behaviors in their social context. Despite criticism that qualitative data are 'soft' and elusive, they are still empirical. It is documentation of real events, records of what people say, observations of specific behaviors, and analysis of written documents (Neuman 1997). There is a strong movement in the field of evaluation and sociology in general away from positivist, quantitative methods toward more naturalistic ones, because they potentially have more explanatory power and acknowledge the biases inherent in research (Guba 1990b; Greene 1994).

There is great diversity in the way researchers approach the use of qualitative methods and theory generation. Guba and Lincoln (1994) assert that each researcher subscribes to a certain paradigm of social reality and their methodology for inquiry falls out of that world-view. This includes how they generate theory or if they are even concerned with going beyond description at all. A quantitative researcher usually begins with a theory and hypothesis and then creates variables to test in social settings. Qualitative researchers often reverse this process by asking a question, collecting data and then developing theory from their findings (Neuman 1997). Patton (1990) argues that one should not be overly concerned with how theory is generated in evaluation research. He states that "there is a very practical side to qualitative methods that simply

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[1] See Chapter 2, specifically page 17 for an overview of the criteria of adaptive management.

involve asking open-ended questions of people and observing matters of interest in real-world settings in order to solve problems, improve methods, or develop policies."

While there were some initial ideas generated concerning management in these areas, no firm theoretical position was established before the data collection period of this project began. A preliminary review of the literature was completed to immerse the researcher in some of the basic concepts of protected areas management, the sociology of organizations, and adaptive management. Once in the field, themes began to emerge from the personal interviews that led to new lines of social theory. For example, if respondents consistently stated that business interests dominated the policy agenda in parks, literature was sought that dealt with this topic. Much of this material is already presented in the literature review in Chapter 2. The next sections detail the specific strategies and methods employed.

3.5. Specific Strategies

The research plan in this thesis is based on the steps necessary for effective evaluation as outlined by Krause (1996). Elements include background research, specifying the program's goals, selecting the research design, data collection, analysis, and interpretations.

3.5.1. Background Research

The first task of evaluators is to gain an understanding of the programs they wish to review (Krause 1996). As previously detailed, this meant performing the initial literature review of adaptive management concepts that are presented in Chapter 2. In addition, a preliminary investigation was initiated of available sources relating specifically to management in the FMF to establish historical timelines. These sources included both historical documents and informal interviews with knowledgeable people. This exercise helped to provide an overview of how management developed in these areas and to highlight turning points of major policy or management changes. Turning points were selected to represent times when major changes or times of controversy took place. These turning points are meant to focus attention on a few significant events rather then every minor change in policy and management direction. This was advantageous because the history of this area, Jasper National Park in particular, is long and complex. These points provided a specific focus to times when certain issues were at the forefront which helped to guide an interview.

There were times however, that these turning points became cumbersome. When in the field, it was discovered that many people did not share the same opinion on the significance of certain historical decisions. Others suggested that completely different times were of greater importance in determining current conditions. Focusing on turning points also ignored times that were free of controversy and change. Why certain things did not happen may be just as sociologically significant and interesting as why others did. Often respondents spoke in generalities about different periods of management as opposed to one specific event. In the end, the turning points concept was used when it was useful and abandoned when it was not. Respondents were permitted to describe what they felt were significant events and were questioned about the established turning points later.

3.5.2. Specifying the Program's Goals

The type and degree of adaptive management is specified as the criteria for evaluation and is already defined elsewhere in this document. It is also important to look at the goals that these jurisdictions have set for themselves both today and in the past. Public policy is shaped by changes in societies and must be judged by the standards of the times in which they were created. The historical context must be accounted for by not putting unrealistic expectations on the policy makers of the day (Fox 1987; Wallace et al. 1995). For example, Parks Canada today strives for successful ecosystem management as their mandate. Has the Park always been successful in fulfilling this goal or were there other goals that it was able to accomplish? Have they been adaptive to changes in ecosystems and societies? Were the broader issues of the day reflected in their policy making? What were the goals of management in the past and were they successful in achieving them? One of the greatest challenges in this project is to account for the historical context of management decisions and not make judgments based solely on today's standards.

Using the criteria of adaptive management, a set of questions was created to guide the research process. These questions were later used in the interview stage of the project. Figure 3.1 outlines some of the types of questions that focussed on a specific turning point.

- How did you become involved with the issue?
- What changes led to this becoming an issue?
- What were some of the differing opinions on how to manage the resource at the time?
- What were the different options available at the time?
- What information was available at the time of the decision?
- Why was the choice made as it was and why were other choices rejected?
- Was public opinion solicited before a decision was made?
- Were concerns of the public included in the decision-making process and reflected in the outcome?
- Did the public feel that their concerns were being listened to?
- What was the relationship like between management and field staff i.e. wardens, interpreters?
- Were the views of field staff incorporated into decision making and planning?
- Were ground level staff able to make recommendations for changes after the decision was made?
- Were there any other opportunities for feedback and adjustment?
- Was consideration made for management decisions in other jurisdictions i.e. Switzer, Willmore, or Jasper?
- Was there any coordinated effort among the different jurisdictions to manage on a larger scale than just their own area?
- Was there effort made to share information?
- What was communication like between the different areas?
- Who were some of the key people involved at the time of the decision?
- Were some people more able to get their viewpoint put into action?
- Was the decision made locally or did it come from Ottawa/Calgary/Edmonton?
- How was a decision eventually reached?
- Do you think the decision would have been made differently in hindsight?
- How did the changes in park policy affect the management decisions?
- Did the management choices or new information gathered affect subsequent policies?
- Do you believe the management structure was flexible and responsive to change?
- Was the organization adaptive?

Figure 3.1. Research questions (also used as interview questions).

3.5.3. Research Design

This chapter has already demonstrated the logic of choosing qualitative evaluation methods to research management issues in the FMF. This section outlines some of the specific choices made concerning sampling techniques. Patton (1997) suggests that evaluations must be flexible and adaptive to the situation. The most effective method of finding relevant information for this project was through personal interviews and document review. Additional sources of information came from participant observation and a review of other researcher's personal interviews.

Purposeful sampling techniques were used to find key informants to interview. Three of these techniques that are most applicable are snowball, opportunistic, and politically important sampling (Patton 1990). Snowball sampling involves asking each person interviewed to name others who have firsthand knowledge and special experiences regarding the issue. Opportunistic sampling takes advantage of new discoveries whenever they might arise. Contacts can be made from chance meetings or by following leads obtained in document review. Politically important sampling involves questioning those who were key in the policy decision making process. For this study this meant people from Parks Canada, Alberta Environmental Protection, local communities, aboriginal groups, environmentalists, business groups, government officials, and others.

There are no specific guidelines for the size of a qualitative sample, however it is necessary to hear the stories from representatives of different stakeholder groups. The researcher knows they have sampled sufficiently when the same ideas are being expressed repeatedly (Krogman 1996). One must be cautious however to find respondents who express the range of opinions on any given issue. For example, the results could be severely biased if only Parks Canada employees were interviewed. A careful search was made for people who may have had dissenting opinions from the current resource managers and policy makers.

One way to prevent bias entering the research is to take advantage of all available information through the process of triangulation. Triangulation means using multiple methods and sources of information to cross-check your findings. In a case study framework this allows for flexibility in data collection and minimizes the chance of misinterpretation (Stake 1994). The more sources of information used, the more accurate the findings will be. For this reason, document review is also a major component of the project. Historical policy documents, governmental publications, journals, diaries, magazines, newspapers, and other sources were consulted and analyzed. These documents shed light on what was the official policy of the day as well as dissenting opinions and commentaries on their effectiveness.

3.5.4. Data Collection

The main phase of data collection took place between the months of June and August, 1998 from a research base at the Palisades Center in Jasper National Park. Additional interviews were conducted through the winter of 1999. The interview process proved to be full of challenges. The primary target for interviews was the staff of Parks Canada, a group of people who are extremely busy with the crush of tourists in the summer months. The residents of Jasper also tend to work long hours in the summer as business in the townsite tails off significantly in the winter. Often there was great frustration in trying to make appointments to meet with people and to have them show up at the designated time. Parks staff, however, were very helpful and accommodating when their schedules permitted. There was also a challenge of distances. Respondents lived in communities all over the Model Forest, into British Columbia, and throughout the province of Alberta. In an effort to interview everyone in person, a great deal of time was spent traveling to these different locations.

Interviews generally lasted between one to two hours and took place in whatever location was comfortable for the respondent. This often meant the person's place of business but also included restaurants, bars, barns, personal residences and on the trail. Most interviews were taped with a micro cassette recorder when acoustic conditions were favorable and if the person was not made uncomfortable by the machine. Regardless of whether the session was taped, extensive notes were taken to capture the essence of the interview and clues given by body language. The interviews began with general discussion about personal backgrounds, a summary of the project, and the respondents history in the area. This served to 'break the ice' and immediately create a less formal atmosphere where people were comfortable discussing their views of policy and management. From this point the interview generally followed the list of questions that are presented in Figure 3.1 but would often naturally flow to where the respondent would lead. Interviews were often derailed far off-track when people started to relate stories about their experiences in the area. Some of these stories provided great moments of insight into how management affected people on a very personal level. In virtually every interview the full set of questions was exhausted which helped to compare people's responses.

Not all firsthand accounts of management and policy were obtained from the more formal interviews. There were several opportunities to meet with park managers, employees, and people with interest in parks in social settings. The most memorable period of participant observation occurred on a six day, horse-assisted backcountry trip to retrace David Thompson's route through the Whirlpool Valley and Athabasca Pass. The members of this party included local historians, former wardens and academics interested in the history of Jasper National Park. This was an incredible opportunity to listen to stories of how the park was managed in the past in an unconstrained setting as well as to engage in shorter, more intimate conversations that could not be considered regular interviews.

When contacted for an interview, some people said they felt they had nothing to offer the study and suggested others who did. When asked briefly about their views, these people often did have very relevant and valuable information. In addition to personal interviews there were other primary sources on which to draw. The Jasper-Yellowhead Oral History Project conducted by Vikki Wallace contains valuable personal accounts of former Model Forest residents, some of whom are now deceased. Also, a series of personal interviews with Jasper residents conducted in the summer of 1997 for research by Tom Beckley of the Canadian Forest Service was made available. This study examined indicators of community sustainability and some interviews contained information relevant to Parks Canada's relationship to the townsite. The Oral History project yielded nine relevant interviews while the Forest Service project contained 14.

Gathering secondary sources was also a major component of the data collection. There is not extensive literature written on each protected area of the Foothills Model Forest, nor are there many documents produced by each area themselves. Some rare and

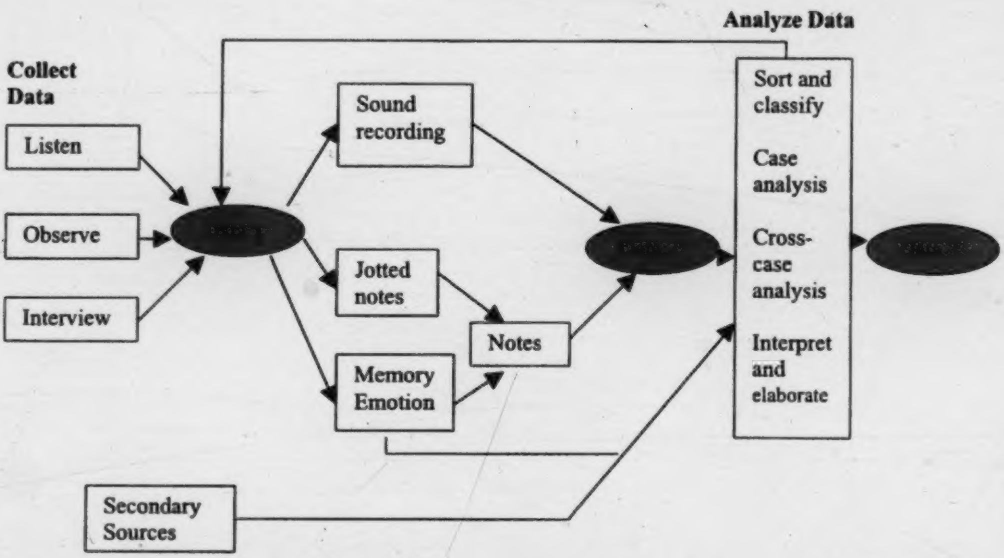
Analyze Data
Collect Data
Listen
Observe
Interview
Sound recording
Jotted notes
Memory Emotion
Notes
Secondary Sources
Sort and classify
Case analysis
Cross-case analysis
Interpret and elaborate

Figure 3.2. Path model of data collection and analysis (Data 1 = experience of researcher, Data 2 = recorded data, physical data, Data 3 = processed data in final report) Source: Adapted from Neuman, 1997

3.2. From this, field notes, tape recordings, and summaries of interviews were reviewed to lend evidence to or find conflicts from the assumptions in the first stage. At this juncture evidence from the secondary sources was also incorporated. No specific method of coding was used for the interview analysis because interviews were not transcribed. Rather both case and cross-case analysis were employed (Patton 1990). Case analysis involves examining each interview separately to uncover themes that can be compared with themes from other interviews. With cross-case analysis, each interview is studied to find references to a particular theme or criteria. An example in this study was to scan each interview for comments on a specific criteria of adaptive management and then compare responses. The final stage in the analysis was to sort the data into themes and criteria and present them in this report.

Many people are leery of qualitative methods because the research is not easy to duplicate. Some are worried about the reliability and validity of the work because the researcher's biases can so easily affect the results. Reliability refers to whether the same results would be produced by a different researcher or research procedure. Validity is the property of being genuine in portraying attitudes and characteristics (Marshall 1994).

difficult to locate documents were provided by interview subjects. Some of these sources would likely have never been uncovered without the assistance of those people. The majority of the literature collected was from the University of Alberta Libraries, the Parks Canada Warden Library in Jasper, and the Jasper-Yellowhead Museum and Archives. Any relevant documents such as internal memos, papers, diaries, newspaper clippings and others were examined. Historic policy documents provided the perspective of what the managers in that time period were hoping to achieve. This could be checked through the personal interviews and published commentaries.

The data collection yielded a significant amount of information for analysis. It is difficult to break down the number of personal interviews into discrete categories of expertise in a particular region. Some individuals were knowledgeable about several regions while others only one. In total, 28 personal interviews were conducted and are outlined in Table 3.1 by the areas of expertise of those interviewed. Note that the sample for some regions is considerably smaller reflecting the lack of experts for that region and a shorter, less detailed management history.

3.5.5. Analysis

Patton (1990) explains that there are no absolute rules to follow during analysis of qualitative data, only general guidelines. Each researcher tailors their analysis to fit the type of data collection methods they used. Neuman (1997) outlines many of the technical aspects of qualitative data analysis including the method of choice used here; successive approximation (see Figure 3.2.). This method involves beginning with a set of research questions, a framework of assumptions and concepts, plus a vague of idea of some emerging themes from interviews and personal experiences. This yields Data 1 in Figure

Table 3.1. Number of interviews by region (Primary refers to the individuals primary region of expertise. If an individual has knowledge of other regions, these are recorded in secondary)

Region	Primary	Secondary	Total
Jasper	19	2	21
Willmore	4	4	8
Switzer	5	5	10
Total	28		

Every attempt was made throughout the research process to check personal biases and to strive for the most accurate and truthful product. Patton (1990) suggests several ways of enhancing the reliability and validity of data analysis. One way is to test rival explanations. This means looking for individuals who have differing opinions on a specific matter and testing to see if their idea may be true. One can also look for negative cases or instances where the general theory does not fit as expected. Finally as previously explained, he recommends triangulating different sources of information to test for congruency of findings. Perhaps the truest test of the work is whether the study group themselves concur with the results. As interviewing advanced and themes emerged, the new assertions were tested by asking respondents if they agreed with the initial conclusions. This permitted modification of some early ideas based on the continual feedback. Key interviews with people who possessed a rich knowledge of the area in question were saved until the end of the process to further test results and conclusions.

3.5.6. Interpretation

The interpretation of the research is presented in the following chapters. The main goal for the thesis was to evaluate whether adaptive management has been practiced in the FMF. However, there is also a story to be told about policy development beyond whether or not it is adaptive. Kaplan (1986:770) writes that in the absence of defining criteria, a narrative can often be the best way of "imposing order on complexity, considering relevant factors." Stories explain changes over time, describing events as many people have experienced them. They are pervasive in our lives and many people, including political policy-makers think in these terms. There are criteria by which they must abide; they must be true in that they account for differing perspectives and need to accurately reflect these, they must be rich and tell of actors and their settings, and they must be consistent, congruent, and unified (Kaplan 1986). To achieve this end, extensive use of quoting is included of those who participated in the project. This follows in the tradition of researchers such as Berger and Luckmann (1967) who use anecdotes to reveal individuals' construction of an event. Allowing people to speak in their own words demonstrates the richness of personal experience as it pertains to their role in making management decisions. All quotes presented are verbatim transcriptions of comments from various interview subjects.

One must be as cautious in interpreting and presenting findings as they are with data analysis. Denzin (1994) warns that stories can be told in different ways and biases can slip into presentation. Every person has a unique writing style and chooses to present certain details. This report presents a certain set of issues and stories that have been deemed significant based on what people have said. Other details are omitted that do not illustrate a larger issue but may have importance to various groups. The ultimate test of interpretive validity will come after this text has been released and people decide if they agree with the findings. It is believed that the nature of the issues researched herein lend themselves well to qualitative study and fair interpretation. The information interviewees supplied was largely factual or covered opinions on matters that people were not afraid to discuss. There were few times when people appeared to be holding back or that their body language contradicted what they were saying.

3.6. Strengths and Weaknesses

The greatest strength of this method of inquiry was the flexibility it afforded. There was ample opportunity to investigate new avenues when an interview yielded particularly interesting or significant information. This method was not as confining as a survey could potentially have been. Surveys have a structured format and provide little opportunity for respondents to express their ideas in their own words. The data was particularly rich because the diversity of opinions collected was framed in each person's own experience. Qualitative field work is also useful because it immerses the researcher directly into the environment of the study. This affords an opportunity to witness firsthand the interactions of the study group and subtle processes that may not be realized from an outside position.

One of the potential drawbacks of the flexibility of the method is that key points could be missed. Because there is no definitive sample in this study, it is not certain that people with vastly different stories were not overlooked. It is also quite easy for the researcher to focus on those parts of the work that they find most interesting while ignoring key elements. These same problems could arise in the interpretation of the work where important parts of the development are entirely missed. There is no guaranty that another method would have been more effective to remedy these situations. Choices must be made in any method of who will be sampled and what questions will be asked. One way of overcoming this problem is to consult as many people as possible, particularly those who have intimate knowledge of the area or who have done previous work there. Very early in this study, several key informants with years of experience researching the parks provided valuable contacts of people on both sides of major issues. An additional way to improve the validity of this type of work is to present those key informants with drafts of the final document to find errors or omitted points.

Other potential weakness of the method that may discourage others from attempting it are the associated time and financial costs. It was time consuming to travel the distances required to meet with many of the people interviewed. Often it took many attempts at arranging meetings before an appointment could be established. This can be addressed by trying to set up meetings well in advance of the desired interview time and making an effort to meet the person face-to-face beforehand. One must be prepared for frequent scheduling changes and have backup plans for other research activities. In this study, it was much easier establishing contact with individuals in the winter months when the visitor pressure on the park was far less than in the busy summer months.

3.7. Ethics

One of the prime concerns in social research is to protect the participants who graciously take part in the project. People share their stories and expose important details of their lives. Permission to carry out the research was granted by the Faculty of Agriculture, Forestry, and Home Economics Ethics Committee. Their guidelines have been strictly adhered to throughout the research project.

Most concern over ethics in social research arises from issues of harm, consent, deception, privacy, and confidentiality (Punch 1994). There were no concerns regarding harm or deception in this project. Every participant was informed of the purpose and goals of the research both orally and through a written summary (see Appendix I). This outline also acted as a written consent form that informed participants that they may refuse to answer any question or end the interview at anytime they desired. To respect privacy and confidentiality no individual will be identified in this thesis or any other written reports, either by name or by identifying characteristics such as their specific occupational position or activities. All written summaries of interviews were given an identifying number that did not carry the respondents name. The code sheet for these numbers was kept in a separate location from interviews and was not kept on file on a computer. All potentially sensitive computer files were password protected in addition to a hard-drive password on the research computer. Tapes were kept under lock and key until they were analyzed and all tapes have now been destroyed.

4. THE EVOLUTION OF POLICY AND ADAPTIVE MANAGEMENT

4.1. Introduction

This chapter discusses the historical development of policy and management in three protected areas of the FMF and the Yellowhead corridor. Each section presents an overview of the management history of a region beginning from the park creation, or in the case of Jasper National Park (JNP), even earlier. The story of each protected area is told within its own section to give a sense of continuity to the account. Comparisons between the jurisdictions, along with a general discussion appears in the following chapter. The main source of information for more recent events, those within approximately the last 40 years, is from personal interviews. Secondary sources are more heavily relied on for periods that are outside the grasp of memory of those interviewed. Direct quotations are presented in italics and are used to illustrate a specific point and provide a firsthand account of an individual's experience with management and policy.

The reader will notice a pronounced discrepancy between the length of each account as the history of Jasper National Park is longer with much more detail than either William A. Switzer Provincial Park or Willmore Wilderness Area. Willmore in particular has very few visitors or major changes in its management direction.

4.2. Jasper National Park

The management history of Jasper National Park is long and complex. The park has seen many changes over its eighty plus years of development. The philosophy of management has changed so dramatically that activities once permitted, such as mining and logging, would now seem ludicrous to allow. The following section takes a brief look at life before the formation of the park and factors that contributed to its creation in order to show the philosophy in which early parks were grounded. Only management history is discussed in this chapter and not a complete history of the park or the townsite of Jasper. For example, incidents such as the internment of Japanese Canadians in the park were not management actions of Parks Canada nor were changes in the administration of the railway. Therefore these types of issues will not be presented unless they impacted the management of the National Park.

4.2.1. Pre-Park Developments and Park Establishment. 1810-1907

The Rocky Mountains of west-central Alberta were likely not used as permanent dwelling places for aboriginal peoples. The Sekani, Shuswap, Kootenay, Salish, Stoney and Cree seasonally hunted the rich sources of game such as moose, caribou, bison, mule deer, bighorn sheep, and waterfowl (Great Plains Research Consultants 1985). These people generally lived outside of the current park area in places such as the Foothills and the Peace country. Life in the area would change forever after the first European appeared in the territory. In 1810, David Thompson became the first European to set foot in what is now Jasper National Park. With the help of an Iroquois guide, he made the first recorded traverse by a European of the Whirlpool Valley and Athabasca Pass (Great Plains Research Consultants 1985). Thompson opened the door for missionaries, fur traders, and explorers to follow his steps and leave their imprint on the mountains (Lothian 1987).

Developments in the region sprouted not long after Thompson made his legendary journey. A trading post later to be called Jasper House was constructed on Brule Lake at the east end of the park in 1813 (Great Plains Research Consultants 1985). The post was used by the North West Company to trade furs and barter with the native peoples. At this time there were mostly Iroquois living in the region and at the post as the other tribes had moved away from the European arrivals (Gainer 1981). Jasper House was eventually relocated almost 23 km south along the Athabasca River in 1821. It was quite difficult to eke out a living at this time in the Athabasca Valley. Most travelers were passing through the area, stopping to trade furs, but few stayed to build homes and settle. Jasper House became run down and was abandoned in 1884 as no one desired to stay in the harsh and lonely environment. People were waiting for a railway line to bring prosperity and more people into the remote region as it had in the southern part of the province.

In the south, a fascinating new discovery had been made by two employees of the Canadian Pacific Railway Company; a series of natural hot springs that were a prized commodity in the day (McNamee 1993). People believed that the springs had natural healing properties and were willing to pay to bathe in them. Exploiting the values of these hot springs became the impetus for creating Canada's first national park in 1887, later to be known as Banff. The federal government wanted to attract business for its railway and a national park would motivate people to come and use the hot springs and enjoy the scenic wilderness (McNamee 1993). The leaders of the day realized that in order to attract tourists it would be important to preserve the natural integrity of the park. Two years later the Canadian government passed the Rocky Mountain Park Act to firmly establish the boundary of its new park. This piece of legislation was modeled on earlier actions in the United States in the creation of their first parks. This act would become an important piece of legislation in the creation of Jasper National Park years later.

Back in the northern Alberta Rockies, proposals were under way for a railway to cross the mountains and connect the northern half of the province to the British Columbia coast. In October of 1902, the National Transcontinental Railway Act was passed enabling the Grand Trunk Pacific Railway to build a rail line that followed the Athabasca and Miette corridors (Lothian 1987). Three years later the construction of the railway began, opening up a new set of possibilities in the region. People were once again inspired to try and make a living in the area with the advantages that the came with train travel. The federal government, realizing the potential of the region and minding the success of Banff, created Jasper Forest Park to attract tourists and inject economic resources into the area. The park was officially founded on September 14, 1907 with a land area of 12,950 km^2. The Honourable Frank Oliver, Minister of Interior instructed the Superintendent of Forestry to create a bill patterned on the Rocky Mountain Parks Act to establish the park. Reservation was actually made under the Dominion Lands Act due to a conflict over land rights with the provincial laws of Alberta (Lothian 1977). The early establishment history of parks reveals trends that would become pervasive in parks for many years; the desire to attract tourist dollars and the role of political power in decision-making.

4.2.2. The Early Years of Jasper Park. 1907-1930

In the years after the creation of Jasper Forest Park, the first administrative actions were taken to set up a bureaucracy within the park. The first acting superintendent, J.W.

McLaggan was appointed in 1909. He was succeeded in 1913 by the first permanent superintendent, Colonel S.M. Rogers in 1913. Two game wardens started work patrolling the park for poachers and other illegal activity in 1910. While there were some conservation measures taken, the emphasis for management in these early years was clearly to attract tourists to the park. Colonel Rogers apparently ran his post like an autocrat, forcing his view of the park on everyone (Great Plains Research Consultants 1985). He enforced the park vision of the day by creating trails, roads and new tourist accommodations.

There are many points that illustrate the government's desire to showcase its new park. The railway finally opened to passengers in April 1912, creating a need for places where visitors could stay. The townsite of Jasper was surveyed in 1913 to serve the tourist traffic with enticing shops and hotels with a rustic look that would be visually appealing and remind the visitor of a quaint European style mountain village (Davidson 1990). Trails were cut to scenic attractions such as Maligne Lake and Pyramid Lake to allow easier access for visitors. In 1915 the first major tourist accommodation at Lac Beauvert known as 'Tent City' was built under the authority of Colonel Rogers (Lothian 1987). There was significant interest in these accommodations in the early years and the lease was soon bought by the Canadian National Railway Company, a reorganized version of the Grand Trunk Railway. In 1922, construction commenced on a set of permanent structures that were renamed Jasper Park Lodge, a facility that still stands today. One stunning example of political influence that encouraged development occurred when Agnes Laut tried to open an artist's retreat on Lake Edith. Local park officials did not want the facility to be built to protect the lake and also because the colony would only be for artists, thereby excluding many other park users. Laut was able to use her connections with federal politicians to have the lakeshore subdivided and cabin construction began in 1920 (Buchik and Taylor 1996). Many of the lots on this lake are still being leased to the public, a source of contention with some local residents and tourists.

One of the darker moments produced from the desire to attract tourists to JNP was the eviction of aboriginal people living in the park. In 1910, there were six Metis families, four Moberly, one Joachim and one Finley living in the park. All of these families appear to be have been from Iroquois descent (Gainer 1981). After the park was established, the federal government and park officials wanted these people removed. They were regarded as squatters who would detract from the pristine image that the government had created for Jasper Park (Great Plains Research Consultants 1985). Only one homesteader was able to secure his property when people were removed to adjacent lands. Lewis Swift built a farm north-east of the Jasper townsite on an area called the Henry House Flats. The government attempted to move him off of this land but he had claims that superseded their authority. His disputes with the government became so emotionally charged that he actually held off federal and Grand Trunk Officials with a rifle for three days when a disagreement arose over the placement of a rail line. This period of time shows how park officials wanted to preserve a sanctuary for tourists at the expense of individual rights of those living in the area (Gainer 1981).

Not only was tourism promoted in the early parks but also the extraction of natural resources. The federal government viewed the parks as having many possible sources for economic gain as long as it did not interfere with the visitor experience. The mountains were a rich source of various resources such as coal, limestone, and timber. Therefore in 1910 the first mines to extract coal were established in the east end of the park at Pocahontas. Limestone quarrying began in 1911, followed by logging of the

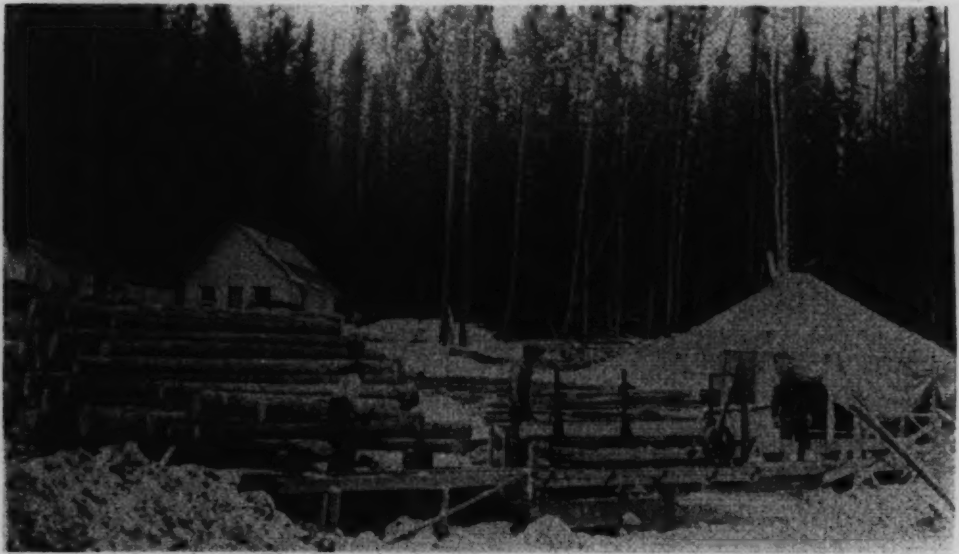

Figure 4.1. Logging at Tie Camp in the Whirlpool Valley (Parks Canada/Jasper National Park/Photographer; C.V. Phillips)

Whirlpool Valley in 1919. There was a strong feeling among park employees that these activities were acceptable and even potentially useful for wildlife by opening up forest enclosed habitats. There were some dissenters who felt that parks should be about preservation and not economic gain "but public pressure and therefore political considerations had made it impossible for these idealists to put their ideas into practice" (Gainer 1981:72).

There are instances in the early history of the park where officials tried to adhere to a preservation mandate for the park. While most activity was designed to promote tourism, some realized that it was necessary to conserve park resources both for future generations and to ensure that tourists would still come to visit. To meet this end, the Department of Interior became responsible for administering the recently signed Migratory Birds Convention Act and to effectively handle this responsibility, they created a wildlife branch to deal with concerns over wildlife management. This research wing of the Department later became its own agency as the Canadian Wildlife Service (CWS) in 1966 (Lothian 1977). In 1917, elk were re-introduced into the park as native animals were extirpated from over-hunting. Eighty-eight animals were brought in from Yellowstone National Park in an effort to reestablish an ecological process that had been interrupted by European intervention. Another conservation measure was to establish a warden service to ensure the conservation of wildlife and plants from the pressures brought on by the growing population. While many in parks administration were promoting tourism, the warden service was protecting the park from the increased traffic volumes (Gainer 1981). Parks policy at this time was not clearly written to either enhance tourism or protect resources. In fact "when the early in-park policies on resource management are considered, it becomes clear that a strain of ambiguity runs through them" (Great Plains Research Consultants 1985:88). Parks policy, while focussed on conservation, was dictated largely by political forces rooted in economic and business development.

One strong personality who imposed his view of conservation minded park management at the time was the Director of the Dominion Parks Branch, J.B. Harkin. In 1911, the Department of the Interior recognized the need to have its protected areas managed within is own department and commissioned Harkin to the task (Lothian 1977).

Harkin had an almost mystical view of nature and felt very strongly about the conservation of parks. He believed that national parks "exist in order that every citizen of Canada may satisfy his soul-craving for Nature" (McNamee 1993). Harkin realized that because his department was in an agency responsible for overseeing extractive industries such as mining, he must use economic reasoning to preserve the parks. To prove his point that protected areas were economically viable, he demonstrated to parliament that scenic lands were valued at $13.88/ acre while wheatland was worth $4.91/acre (Marty 1984). This is one of the earliest examples in parks where a strong personality was able to direct policy based on their view of how a park should be managed.

Harkin was also instrumental in resolving boundary changes in the park that were a source of great political battles. In 1911 the park area was reduced to 2,590 km^2 when the boundaries were redrawn to 16 km on either side of the railway (Lothian 1987). This stunning example of a business dominated policy agenda angered many including private outdoor clubs such as the Alberta Fish and Game Association, the Campfire Club of America and J.B. Harkin himself because it demonstrated that politicians were mainly interested in using parks for revenue generation. After political lobbying and protest, the park boundaries were increased in 1914 to encompass an area of 11,396 km^2. Further disputes occurred when in 1927 an additional 2,538 km^2 of land south of Sunwapta Pass was added to the park. The province of Alberta protested because the impending Transfer Act would have given them control over this now excluded piece of land. There was apparently very little rationale behind the selection of lands to be included in the park (Lothian 1987). Some believe it was strictly for administrative ease while others feel it was just an example of the political infighting over the philosophy of what the parks should be (Great Plains Research Consultants 1985).

In 1930, many of these disputes were put to rest by the passing of the National Parks Act and the Transfer of Resources Act. The Transfer Act established the division of federal and provincial lands and gave power over resources to the provinces (Cairns 1992). With the passing of the National Parks Act, the boundaries of Jasper National Park were established to include 10,878 km^2, effectively ending dispute over land control with the province of Alberta. All resource extraction in parks was ended with the passing of the new Act, likely due to the mounting political pressure to end industrial development (Great Plains Research Consultants 1985). Tourists were becoming more common due to improvements in transportation and they were increasingly displeased to find cutting and mining in a natural area. The creation of other parks at this time showed that government felt the political value of parks was high, mostly in terms of commercial gain from tourism but also for preserving wilderness landscapes (McNamee 1993). The National Parks Act stated that 'The National Parks of Canada are hereby dedicated to the people of Canada for their benefit, education and enjoyment…and shall be maintained and made use of so as to leave them unimpaired for future generation." (Eagles 1993:58). This conservation minded text could have ended the debate over the proper use of the National Parks but this discussion was to continue for many years.

4.2.3. The Growing Park. 1931-1960

The period between 1931 and 1960 was a time of growth in Jasper National Park as transportation and access to the park improved. It was also a fairly quiet time in the management history of the park as there was very little public controversy or internal debate as to the meaning of protected areas in general. The published literature on parks for this time frame is also very sparse as most authors concern themselves with the very early or more recent years of parks management.

The pattern of development witnessed in the formative years of parks continued through the middle years of the century. Parks managers and federal officials realized the potential economic gains of the park and strove to increase the ease of access to Jasper. This was achieved by constructing roads to link the townsite to Edmonton in the east and Banff in the south. Construction of the road to Edmonton began in 1928 but was not completed until 1931 (Lothian 1977). Much of this work and subsequent upgrades made use of federal work policies to provide employment to those suffering from the economic chaos of the depression. In an effort to save money, only essential materials were used and no frills were incorporated in the building of these roads. The Jasper-Banff highway was an extremely arduous undertaking as the road traveled through steep, rugged, high-elevation terrain. Roadwork began in 1930 but it took until 1938 to connect to the Athabasca Glacier and another two years to reach Lake Louise. Life in these work camps was very rough and parks staff apparently took no sympathy to the workmen's condition.

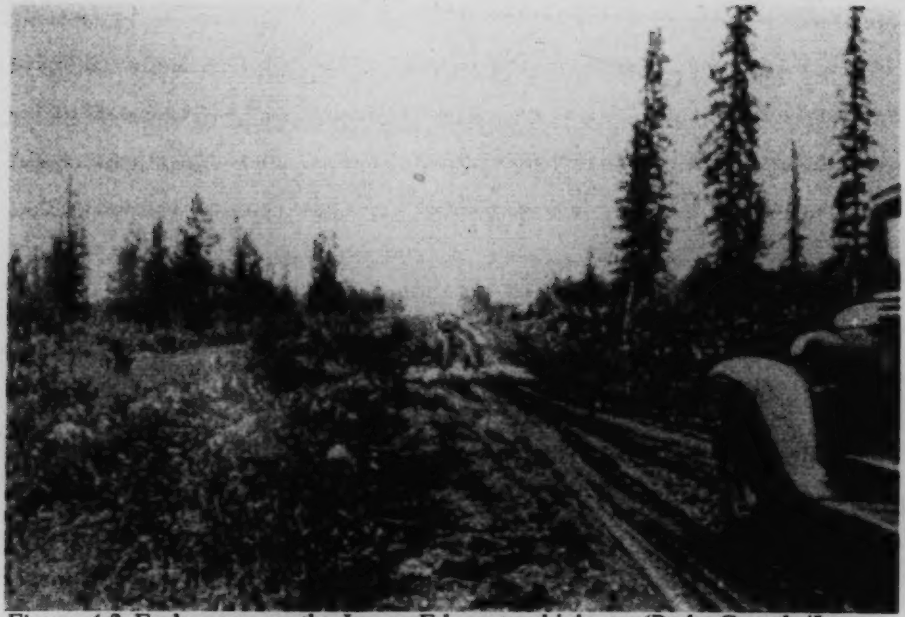

Figure 4.2. Early years on the Jasper-Edmonton highway (Parks Canada/Jasper National Park)

Worker's were forced to stay onsite and were not allowed trips into town without written permission from their supervisors (MacGregor 1974). With the new roads came a proliferation of hotels and services which afforded more than just the hardy traveler an opportunity to visit the park. Tourism increased dramatically through this period with visitation rates typically rising more than 10% a year (Davidson 1990).

In this period park managers were beginning to show more concern for resource management and not just attracting tourists. However, resource management was very different than today's practices that seek to maintain ecological integrity. Managers at that time were more concerned with reacting to problems that arose and used very different methods of solving these predicaments. Predator control programs of exterminating large carnivores were instituted to rebalance a system that had been greatly altered by elk reintroduction.

> *In the 1940s the elk numbers were getting huge, the population was up to 3000. There was a rabies scare in the 1950s and wardens were out shooting and poisoning all large predators. By the 60s the elk were eating themselves out of house and home and were dying beside the road. We*

> *slaughtered elk straight through into the early 70s to the tune of 2600 animals. We were always reacting to a change we made earlier. There was never any foresight into what consequences our actions would have.*
>
> Parks Canada employee

Some people at this time felt that it was often more important for parks to create an environment that was safe and pleasant for the tourist than one that enhanced wildlife conservation. Several former park employees said they were encouraged to hunt as many large carnivores as possible.

> *The official policy in that time was to shoot all predators. The tourists wanted to see the Bambi deer beside the road and we were there to keep them safe. They used any excuse to thin the population of carnivores. Me and a buddy shot eight grizzlies one year and we thought we were doing great.*
>
> Retired warden

It must be acknowledged that managers in the 1950s were dealing with a very different knowledge base and values system. While predator control would be almost unthinkable in today's climate, it was a commonly accepted practice in those days.

A trend of reacting to management issues can also been seen in other aspects of resource administration. For example, the management of aquatic resources by stocking park waters with non-native fish was largely in response to the poor quality of angling. In an effort to attract fishers to Jasper, Park wardens stocked lakes and streams with several species of non-native fish including brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), Atlantic salmon (*Salmo salar*) and rainbow trout (*Oncorhynchus mykiss*). Some water courses such as the Maligne that were previously void of fish displayed spectacular results and provided tremendous angling opportunities. In 1945 a fish hatchery was built on the Maligne River to more efficiently raise and distribute fish to all the western parks (Lothian 1981). Fire protection is another example of the reactive nature of Park's approach to management. One of the most basic reasons for creating the warden service was to fight forest fires that threatened the visitor experience and safety in the park (Woodley 1995). Almost all fires were suppressed and no effort was made to mimic or replace the effects that this natural process has on the environment. In later

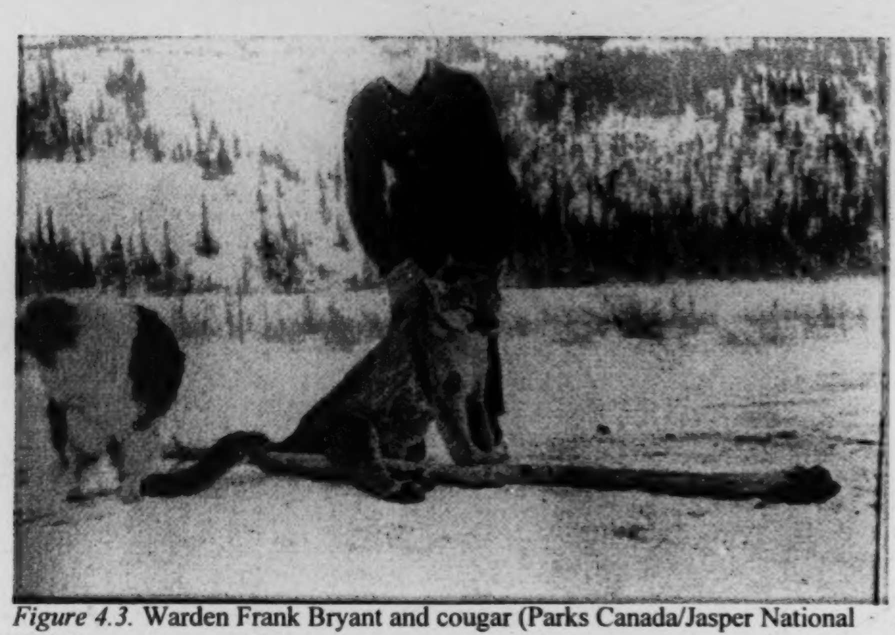

Figure 4.3. Warden Frank Bryant and cougar (Parks Canada/Jasper National Park/Source: Mary Haines*)*

policy directions, Parks Canada would come to acknowledge their own bias for enhancing tourism opportunities at the expense of ecological integrity (National Parks Branch 1964).

The warden service through the middle decades was focussed on tourist management and protection of patrol districts. Wardens were selected more for their ability and enthusiasm to work in the bush than for educational achievements. They did not generally perform research or help to guide policy directives by providing feedback to managers. Each warden patrolled their area looking for fires and poachers while also coming to the aid of lost hikers and climbers. Often the wardens became very possessive of their area after spending months living alone in remote warden cabins.

> *We each became very attached to our particular region. That was your piece of land and you didn't want anyone to mess it up. It got to the point that you didn't like to see hikers or horses come into your part of the world.*
>
> Retired warden

Most former wardens speak very highly about this period of time and the great friendship and reliance they built with their coworkers. Their statements reflect a romantic image of the park warden that has changed with modernization.

> *Things were different back then. You had a problem, you got on the radio and every warden in the park would come help you. There was a great camaraderie among us. Today they want overtime if there truck isn't in the driveway at 5:00.*
>
> Retired warden

Many interviewees felt that the locus of control for parks management was very much located within the park boundaries in this period. Only very broad directives came from the head office in Ottawa as there was no formal, written, national policy in place until 1964. Most superintendents and chief park wardens were able to manage their park as they saw fit and did not get much interference or support from the bureaucrats in Ottawa. According to one former warden, "the administration of parks in those days was definitely autocratic" (Camp 1993:29). The superintendent was relatively free to impose their views of management on the staff of the park. Most respondent's felt that this was good because it gave local concerns a higher priority.

> *When I was a kid the superintendent had all the power and things were actually better then. You could actually get something accomplished.*
>
> Jasper resident

The close relationship of Parks staff with their constituents provided an opportunity for quick reaction to arising issues.

> *Sometimes things took a little longer than they do now but that's to be understood because of communication differences. You could go to the Parks office and get an answer from somebody there. He may have to get some paper work done but you knew right away if you could do something. The power in those days was in the park and not with somebody in Ottawa. The buck stopped at the superintendent.*
>
> Former Jasper businessperson

While there were positive aspects associated with a strong degree of local control, there existed the opportunity for individuals to greatly alter policy based on their personal views. There was no official policy to follow except for general direction from the Parks Act. The dual mandate of preservation and use provided great leeway for an individual to tailor management to suit their favorite projects. For example, the director of the National Parks Branch, James Smart, was an enthusiastic golfer. He translated this interest into the construction of many golf courses in Cape Breton Highlands, Prince Edward Island, and Fundy National Parks to be managed by the Parks Service (Lothian 1977). In Jasper, this often meant that a change in power could reflect a change in regulations, a complaint often raised by residents. One example of this occurred in the mid-fifties when several business people were having difficulty getting permits to build new hotels and cabins. In 1957 there was a sudden, unexpected change in park policy that opened the door to development and permitted new growth and expansion (Davidson, 1990). One resident succinctly described this phenomenon in the following way:

> *You never knew which laws would be enforced and which ones would not. Every time a new superintendent would come in, something would change. It was all about the personalities.*
>
> Jasper resident

Federally, the parks portfolio was frequently shifted to different departments. Some of the major changes were moves to the Department of Mines and Resources in 1935, the Resources and Development Services Branch in 1949, and the Department of Indian and Northern Affairs in 1953. Often these departmental reshufflings were initiated to highlight a specific natural resource sector such as mining (Lothian 1977). Parks do not ever appear to have been a leading concern of politicians throughout this era and were regarded as a money making venture requiring few interventions. The public was rarely consulted and had virtually no input into how parks were run. Management and policy did not create a focus or direction that parks should take resulting in ad hoc decision-making (McNamee 1993). This lack of formal decision-making process opened the door for extensive backroom deals between the government and certain members of the public. For example, some individuals requested additional leases to be granted at the Lake Edith cottage subdivision. At first parks staff rejected the application but some of these people had significant influence with federal officials and were able to get this decision overturned with an amendment to the Parks Act itself (Lothian 1979).

4.2.4. The Changing Environment. 1960-1972

The sixties in North America were a time of great social upheaval and change. People began to realize the serious impact that industrialization was having on the earth's ecological well-being. Books such as Rachel Carson's *Silent Spring* (1962) raised awareness of the effects of pollution and of the shrinking amount of wilderness spaces left untouched. The environmental movement had a profound effect on the way people thought about protected areas and their role in global biodiversity conservation and influenced the managers of Jasper National Park.

While there had been some talk of conservation measures in Jasper in the previous decades, the sixties focused park managers on the growing public support for stronger protection. A report on the management of the park, prepared by Queen's University in 1960, informed managers that while development was possible in the park, it was important to consider the integrity of the ecosystem (Davidson 1990). It was no longer possible to consider only the use and enjoyment half of the Park's dual mandate clause. Residents of the town were aware of the changes that were happening.

> *The atmosphere in Jasper was a lot different through the sixties. The type of visitor had sure changed. I used to patrol for weeks and would hardly see a soul. Now all of a sudden there were all kinds of different people in the backcountry. They weren't all just long haired hippie types either. Some of these people were more demanding and didn't like to see things like horses. They let us know how they wanted things run.*
>
> Retired warden

Federally, the minister responsible for Parks at the time, the Honourable Alvin Hamilton, passionately pleaded with the people of Canada to band together and petition the government for more preservation in the national parks (Henderson 1969). He felt that the park system was largely ignored in the federal cabinet and that without public support the Parks would be overexploited. By 1963, the National and Provincial Parks Association of Canada (NPPAC) formed to protect park areas, the first non-governmental association of its kind in Canada. This organization would become key in lobbying for stricter guidelines, improving regulations, and watching over government actions in the national parks (McNamee 1993). The NPPAC was later renamed the Canadian Parks and Wilderness Society (CPAWS), an organization that remains active in protected areas policy to this day.

One of the great achievements of the NPPAC was pressuring the federal government to create a management policy to apply in all the national parks. In 1964, the National Parks Branch designed the first formal policy document concerning park management in the agency's history. The purpose of the policy was to clearly define what was acceptable in a national park. The document stated that "our National Park System has as its basic purpose to preserve, for all time, outstanding natural areas and features as a national heritage" (National Parks Branch 1964). The authors acknowledged the excessive development of the parks and the misdirection of recreation activities. They called for a different kind of tourism, one based on natural values and not the built environment. This policy document clearly emphasized the value of preservation of the parks for future generations and was a key turning point in park administration. It set out some clear guidelines and helped to connect the piecemeal approach to management. It did not, however, require a specific management plan for each national park. Park managers in Jasper could refer to this policy and get guidance for management decisions but they were not required to set goals to achieve and monitor. There was no section in the policy that dealt specifically with resource management goals. The document helped to clarify the role of parks but it did not necessarily require individuals to implement precise responses to management issues.

Some of the developments in the park subsequent to the 1964 policy document promoted a different type of park use. The Urban Development Plan of 1963 was designed as a better approach to land use in the townsite of Jasper (Davidson 1990). The goal was to make Jasper a Visitor Services Centre that could guide visitors to the natural and cultural heritage resources of the park to tourists. The plan also recommended that development in the townsite be limited to smaller shops that dealt in quality merchandise and not cheap, plastic souvenirs. Park interpretive services originated in the late sixties and early seventies and were designed to promote the natural features of the park in order to educate people about the value of protecting the park resources (Lothian 1981). Officials hoped that by getting people directly involved with the park, they would be more responsible users of its amenities. Educational values were not the catalyst for all growth in the park during this period. The business community was still able to push through some commercial developments in this time frame such as the Marmot Basin ski area in 1964.

There were some major organizational changes in the National Parks Branch through the 1960s. The increase in tourism had put a strain on park resources and there were many inefficiencies in the system. A reorganization in 1963 sought to correct some of these problems by decentralizing operations into district offices (Lothian 1977). A district office was opened in Calgary to unite the management of the four mountain parks. It was hoped that this would eliminate some of the overlapping services and consolidate the various components of park management. Some felt that this succeeded only in adding another layer of bureaucracy with which to deal.

> *There was a continual battle between the regional office in Calgary and at the park level. Some of the superintendents didn't like being told when to do things and where to spend money. There was a lot of political battles at the different levels and you were continually justifying what you were doing.*
>
> Parks Canada employee

Many of the inefficiencies of the system were not replaced because management was caught in a reactive mindset. The Director of the Parks Branch acknowledged that in 1967 they knew very little about natural resource management and that their "actions were often reactive, with little capacity to anticipate problems" (Kun 1981:14). Management actions were generally in response to a specific crisis and were not grounded in scientific information. At this time, quality information was just starting to become available for managers to use.

We really didn't think that much about things like ecological integrity in the sixties. The warden service was there to protect people from the park and the park from people. We might identify hot-spots of major concerns but there was no real consideration for the overall well being of the park.

Parks Canada employee

By the late sixties and early seventies it was growing impossible for Parks managers to ignore the mounting scientific research and public support for protected areas preservation. The Canadian National Parks Today and Tomorrow Conference in 1968 defined a real shift in thinking about the national parks. Participants in the conference highlighted the value of using improved scientific methods to manage ecosystems (Harvie 1969a), questioned the value of wilderness to Canadians (Fuller 1969), and talked of the value of education and public participation (Pimlott 1969). Federal politicians were becoming acutely aware of Canadians' desire to have more parks and ones that were better managed. Elected in 1968, the Trudeau liberals created new parks at an astonishing rate compared to the previous decades by establishing sixteen new parks within ten years (Bella 1979). The minister responsible for parks, Jean Chretien, stated at the National Parks Conference that "if development in the parks is allowed to progress without proper control, will our parks soon cease to be parks as they were originally intended to be?" (Harvie 1969b:3). This statement would be put to the test with perhaps one of the most significant turning points in Parks Canada history. The controversy surrounding the proposed expansion of the Lake Louise ski resort would have a profound influence in the management of Parks and of the mountain parks in particular.

In 1971, Imperial Oil of New Jersey and Lake Louise Lifts proposed to build a massive ski resort in the village of Lake Louise. Environmentalists were outraged by the thought of an enormous structure dominating the landscape in this area and disrupting critical wildlife habitat. Many felt that the development was a foregone conclusion because of the influence of the business community in Parks Canada planning policy (Herrero 1970). The NPPAC and other environmental groups led a massive protest against the government and Parks Canada to defeat the development. After public hearings involving 190 oral and 2,111 written submissions, park managers realized that they must consider public input and rejected the proposal (Kun 1981). This marks the first time in Park's history that environmentalist challenged the power of 'big business' and came out victorious (Dearden and Berg 1993). The power of the decision was felt throughout the mountain park district.

> *In my opinion the Lake Louise decision was the biggest turning point in Parks Canada history. We were caught off guard by just how upset the public could get. We knew after that point that we were going to have to consider the public more seriously. That totally touched off a change in the way we managed in Jasper.*
>
> Former Parks superintendent

Management in Jasper underwent a slow transition in the following decades. The Lake Louise decision drew attention to environmental problems that were occurring within JNP. Park managers were forced to account more for public input and address critical environmental issues such as increasing pollution levels produced in the townsite.

4.2.5. A Slow Transition. 1972-1988

In the years after the Lake Louise battle, Parks Canada appeared to become somewhat leery of consulting the public through hearings. While the agency still maintained an image of openness, many felt that they did not really consider public opinion.

> *Parks started do what they called 'open houses.' What it really meant was information sessions. They'd come and tell us what they were going to do, ask us what we thought, and then do whatever they wanted anyway.*
>
> Jasper resident

It wasn't until 1979 and a new policy, that the need for public involvement was given major recognition.

In 1979, Parks Canada completed the first major revision of its policy (Parks Canada 1979a) that was later slightly revised in 1985 (Parks Canada 1985a). The year also marked a move for the organization into the Department of Environment to highlight the importance of conservation issues and the role of Canada's protected areas (Parks Canada 1979b). These actions reflect the desire of the government to improve the image of Parks Canada and to respond to the mounting environmental concerns of the general public. The 1979 policy document was strongly focussed on Parks' mandate to protect ecological integrity and manage parks as wilderness areas. Section 3.2.1. stated that "natural resources within national parks will be protected and managed with minimal interference to natural processes to ensure perpetuation of naturally evolving land and water environments and their associated species" (Parks Canada 1979a). The policy stated that when active management was necessary it should duplicate natural processes as closely as possible. Other major themes in the policy were improving communication with external agencies, increasing real public consultation, and implementing new research programs. Also included in the document was reference to the new federal Environmental Assessment and Review Process (EARP) that required environmental impact assessments on all federal lands.

One of the key elements in the new policy was the requirement of each park to develop a management plan. The plan was said to "constitute a framework within which subsequent management, implementation, and detailed planning will take place" (Parks Canada 1979a). To this point Jasper National Park had no formal management plan in place. There were no goals prescribed for managers to achieve or a method for monitoring success. A Parks Canada planning document acknowledged that objectives must be clearly stated and that "periodic monitoring and revision are required because conditions inevitably change" (Anonymous 1980:6). Park managers were beginning to realize that some of the concepts of adaptive management like flexibility and monitoring would improve the success of the park. Accomplishments to this end would be slow coming for Parks in the following years. It took nearly ten years for the management plan to be written and in those years few changes were made in ground level management.

While ecological integrity was gaining more attention through the seventies and eighties, management planning did not change dramatically from the previous decades. In the mid seventies, Parks began a process of centralization of services where wardens spent less time patrolling the backcountry and more time implementing management directions. The service was split into management sections such as resource management, law enforcement, public safety and backcountry management. Most interviewees felt that at this point, parks management began to get more fragmented. The different branches of the service did not always communicate effectively with each other.

> *The parks were compartmentalized. Everybody had their little kingdom. Nobody would cooperate or give up the power over their little world.*
>
> Retired warden

Many respondents talked of the influence that individuals could have within their sphere of responsibility. Often an individual with a strong personality or powerful political ties could alter the direction of management.

Parks were making some attempts to incorporate new ecological information into their planning during this era. Scientists were discovering that the exclusion of natural fire from protected areas was dramatically altering ecological conditions. In 1979, Jasper began an active fire management phase where prescribed burns were initiated to mimic natural disturbance regimes (Woodley 1995). It was impossible to let all natural fires burn freely because infrastructure and human lives could be endangered by an uncontrollable burn. Burning sections of the park was an active measure designed to prevent major burns from claiming large tracts of land. In response to public concern, active wildlife management by culling animals was stopped in the seventies. Despite implementing these new measures, Parks Canada still operated in a very reactive manner. They had poor integration of the different programs and did not look at the ecosystem as a whole. There was also little regard to consulting agencies outside of the park boundaries. As one longtime employee of Parks Canada noted:

> *At that point we were just trying to address problems. We're having problems with grizzly bears so we'd go do a little study on them. Then they were forgotten about and we'd go on to something else like vegetation or horse use in the Tonquin Valley. We'd write a report but nothing ever really happened. We focussed on hot spot issues all over the place but did not focus on any type of integrated management. We continued to put in infrastructure and attract tourists but didn't account for their impacts. It was very scattered, ad hoc, and very reactive.*
>
> Parks Canada employee

To address these management deficiencies in the mountain region, Parks Canada in 1982 began a process of creating a management plan in each park (Environment Canada 1988). This process took over six years and involved active public consultation with every step. The first stage of the program introduced the purpose and objectives for the process. This was followed by background data collection and identification of planning options. During the consultation period, the public was presented a range of management options from which they could choose those that would be best for the park. In 1986 the document "In Trust for Tomorrow" (Environment Canada 1986a) outlined a strategy for a new direction in management in the four mountain parks based on this input. This was a time of enthusiasm as both the public and government were working together to better manage the parks. Many people spoke of the positive influence of the Honourable Tom McMillan, Minister of the Environment and his efforts at strengthening park policy. McMillan felt that parks were an important part of Canadian heritage and was dedicated to preserving them for their global significance (Parks Canada 1985b). "In Trust for Tomorrow" was a key document for achieving this goal. It stated that "maintaining ecological and historical integrity is a prerequisite to use any park" as the primary responsibility of Parks Canada (Environment Canada 1986a:3). The planners felt that inter/intra-agency cooperation was very important for accomplishing clearly defined management goals. This document led to the Jasper Core Concept, a plan that identified specific directions for the National Park (Environment Canada 1986b). The final step in the process was to consolidate this information and produce the Jasper National Park Management Plan.

Nineteen eighty-eight was a key year in the history of management in Jasper National Park with the introduction of the management plan as well as amendments to the National Parks Act. The new Act established in law that ecological integrity was to be the chief concern of park management. The Act established boundaries around townsites, required management plans for each park, stressed the need for public involvement, and increased fines for regulation violations (Eagles 1993). The management plan adhered to the Act's goals with the first principle being that "resource protection will take precedence over visitor use and facility developments where conflicts occur" (Environment Canada 1988). Very specific goals were outlined in the management plan even including details as specific as trail rerouting. Some felt that this was actually a drawback with the new plan.

> *The detail in the 1988 plan was almost too great. We spent so much time trying to live up to every one of those objectives. It was good to have clear goals but that was almost excessive. It would have been easier to have some more broadly defined goals and try to accomplish those.*
>
> Parks Canada employee

Despite its flaws, the management plan was a large stride forward in establishing a more effective, ecosystem based approach to management. Parks managers now had a strong Act and clear direction from the management plan.

4.2.6. A New Era. 1988-1999

With a revised Act and a well defined management plan, parks officials were able to begin this most recent era with a clearer vision. However, this vision has not always been easy to maintain as individuals interpret the park mandate in different ways. Most parks managers feel that their purpose is to maintain ecological integrity and that there is no room for debate on the issue.

> *There is no dual mandate here anymore. People who say that are just not reading the legislation. The Act of 1988 clearly stated that we are here to protect ecological integrity above all else.*
>
> Parks Canada employee

Some of those interviewed felt that business interests were still able to dominate the policy agenda at times. They believe developments could still progress fairly easily in Jasper and it was difficult to decline new business proposals. Environmentalists became increasingly frustrated by Parks refusal to turn down key developments. In 1995 a new piece of legislation, the Canadian Environmental Assessment Act (CEAC), dramatically changed the way that Parks Canada operated.

The Canadian Environmental Assessment Act replaced the old EARP guidelines because the former legislation had led to uncertainty and had no strict legal interpretation (Canadian Environmental Assessment Agency 1999). The new Act clearly defined what environmental impacts must be considered and created a strict code of practice to be followed. Accountability and an open process are two of the critical cornerstones to the Act and hold agencies and their employees responsible for environmental effects (Canadian Environmental Assessment Agency 1999). CEAC applies on all federal lands and therefore became critical in the management of Jasper National Park. Every new development was scrutinized under a different microscope where concepts such as cumulative effects on the landscape had to be considered.

> *No one paid much attention to the old EARP process but once it became legislated and people were held accountable, and you have to look at cumulative effects, some senior managers were held to task; the light bulbs went on. We realized we better start talking to people in other agencies around us and developing relationships. If we don't we might be held liable. We need to get common land use practices and apply them on the ground.*
>
> Parks Canada employee

Personal accountability and an open process have made parks planners more wary of quickly approving new developments. The Act helped to remove some of the political pressure of management due to the stringent and clearly defined guidelines.

> *The CEAC process and the public participation has certainly weakened the image of us as being in the back pocket of business. We are a political organization and we have been overturned from higher levels but it is now much more difficult for that to happen. The openness of the process has increased the understanding of businesses of why we make certain decisions in the park as well as the general public's awareness.*
>
> Parks Canada employee

Parks Canada undertook a major update of its policy in 1994, the first time since 1979. The new policy was based on many of the same concepts as in previous documents; "in the preparation of a management plan, the maintenance of ecological integrity through the protection of natural resources and processes will be the first priority when considering zoning and visitor use" (Parks Canada 1994:16). The major difference in this policy was refining the definition and meaning of ecosystem-based management. Section 3.2 of the document is entirely dedicated to explaining and developing criteria by which to measure success. It calls for the setting of goals to be based on the best scientific information available. These goals must be measurable and monitored over time to see if they are being met. It also directs managers to seek alliances with universities, conservation groups, adjacent land owners and management agencies to establish integrated and collaborative management agreements.

There have been some successes in recent years to manage on an integrated landscape scale that goes beyond the park boundaries. In 1995, Jasper National Park became a partner in the Foothills Model Forest and collaborated on many projects with other management agencies. The Model Forest has helped Parks to open up lines of communication with managers from other protected areas like Willmore Wilderness Area and with industry partners such as Weldwood of Canada.

> *We're looking at a much broader picture now. To manage this park we know we have to look outside our boundaries. We're talking much more with other agencies than we did before. The Model Forest has helped that. I believe we're doing a much better job at managing this park than we did in the past. It can be a slow process but the effort is definitely there.*
>
> Parks Canada employee

Many managers and wardens spoke of the changes that have been happening in parks management and how they were optimistic that things were improving. For example Parks Canada has been initiating a series of prescribed burns in the park to reduce fuel loads and protect key resources. Studies are underway to monitor wildlife movements in the Three Valley Confluence area and will help inform management choices. The park is trying to adopt a more proactive position in its management direction and anticipate problem areas.

One area of the park that has been the location of much controversy is the Maligne Valley. Concern has been raised by environmentalists and naturalists living in the park regarding the reduction in numbers of nesting Harlequin Ducks (*Histrionicus histrionicus*). Harlequin Ducks breed in fast-flowing mountain streams and are susceptible to disturbance from human activity (Fisher and Acorn 1998). Naturalists noticed that every year, fewer individuals of this threatened species were returning to breed on the Maligne, one of the few known nesting locations in Alberta. The problem was thought to be caused by white water rafting parties that flushed the birds off their territory, thereby reducing nesting success. To prevent this from happening, Parks Canada closed the river to boaters during the breeding season every May and June. This did not satisfy environmentalists who believed the river must be closed to activity year round. Parks appeared unwilling to close the river completely, partly out of concern that they may face legal challenges from the rafting community. In the summer of 1998 the issue was settled when the minister responsible for parks Sheila Copps announced that the river would be closed permanently to allow Harlequin Ducks the space they need for breeding. The reaction was mixed.

> *One person wrote one letter* (requesting an inquiry into declining duck numbers) *and now we have a perfectly good resource taken away. I don't blame the rafters for wanting to sue Parks. For years we were allowed to raft up there and some people have made big investments. Now Parks is going to take that away, and what for, a few ducks.*
>
> Jasper resident

> *I think it took a lot of guts what Sheila Copps did. This is what had to be done. It's what most people in Jasper want and what almost all Canadians want. They realize they've got to listen to us now.*
>
> Jasper resident

Some felt that the Maligne decision was a turning point of the magnitude of the Lake Louise ski expansion rejection. It showed that the government was willing to make the difficult choices in the interest of ecosystem protection. Some questioned the timing of the decision and whether it was really inspired by ecological concern or if it was politically motivated. Along with the Maligne closure came a moratorium on issuing new building permits and an end to any possibility of local government autonomy for the townsite of Jasper. This angered many residents because they had participated in a town visioning process and felt that local managers supported their work. The Copps decisions appeared to come from levels out of the park and discounted their effort.

> *We worked hard on our town visioning process. People came out time after time and we were told how our ideas would be listened to. People*

> *didn't have a lot of faith but we worked on it anyway. Then this moratorium decision comes out of the blue and we felt betrayed. Why did we even bother?*
>
> Jasper resident

Most people interviewed did acknowledge that the decision to close the Maligne to rafting improved the image of park managers, and showed that Parks Canada was willing to take the necessary steps to maintain ecological integrity.

As of this writing, there are several actions to be undertaken by Parks Canada that will influence the direction of management in future years. A new management plan is being developed that will include more strongly defined goals to implement and monitor. The management plan concept is being reviewed through public consultation in the form of open houses and mail-in comment forms. The new plan incorporates concepts from conservation biology including biodiversity protection on a landscape, community and species level (Canadian Heritage 1999). Specific objectives and actions are listed that seek to maintain natural levels of landscape, community and species biodiversity in the park. The plan discusses the need to cooperate with provincial governments and industry groups to ensure effective management on a landscape scale. The proposed management plan addresses problem areas in the park, such as the Maligne Valley, and provides a clearer direction for management to take in the future.

On December 21, 1998, it was announced that Parks Canada would be granted agency status within the federal government (Canadian Heritage 1998). Agency status means that Parks Canada will conduct operations like a business and will be run by a chief executive officer. The CEO must still report to the Department of Heritage but will operate the agency at a greater distance from the political process. It remains to be seen what effect this will have on park management. There are also new amendments to the Parks Act pending that could change some policies relating to Jasper. There are amendments to the Act to legislate townsite boundaries, reduce building developments, and eliminate the possibility of local governmental autonomy.

4.3. William A. Switzer Provincial Park

Management in William A. Switzer Provincial Park is on a much different scale than in a major national park like Jasper. The park is much smaller than Jasper and receives far fewer tourists. There is also less opportunity to manage on an ecosystem level because of its small size and the emphasis on recreation. Switzer is under the authority of the provincial government and therefore has a different set of political issues than the federally run national parks. It is these differences that also make it useful to compare the areas where each can inform the other's policy situation. Some lessons learned from management in a provincial park may help to teach managers in national parks how to more effectively administer their resources and vice versa. Despite their differences, Switzer and Jasper both face the dilemma of balancing the forces of use and preservation of park land.

There was not as much activity in the Jarvis valley of Switzer before park establishment as there had been in the Athabasca Valley before Jasper. Early explorers and surveyors passed through the area, often naming the lakes after themselves, as was the case with Jarvis, Gregg, and Cache. The valley did see some developments such as a small saw mill run by a local individual. The Royal Canadian Air Force established a training center on 20 acres of land on the shore of Jarvis Lake. One adventurous soul even tried to start a beaver ranch to produce fur pelts. This venture was not successful and the remnants of the operation can still be seen on an interpretive trail at Cache and Graveyard Lakes. Some of the aboriginal people who were evicted from Jasper took up residence in the area but most had left by the time Switzer was established. A native burial site is still maintained and can be seen on the road to Jarvis Lake.

The provincial park movement in Alberta began in 1930 with the passing of the Alberta Natural Resources Act. The province had just acquired control over its natural resources and knew the established boundaries of the national parks. John E. Brownlee, then premier of Alberta, was key in developing a system of protected areas to be run by the province. Brownlee realized the value of protecting the diverse and spectacular natural heritage of the province and stated that Alberta has "the greatest heritage of natural beauty in the world, a potential source of wealth which, in the years to come, will yield a greater wealth than we are today obtaining from the flood of grain that is pouring in to our granaries" (von Hauff 1992). The Provincial Parks and Protected Areas Act was established in 1930 and had three purposes; recreation and general benefit for Albertans, propagation, protection and preservation of wild animals and vegetation, and finally preservation of objects of interest (Morrison et al. 1980). The focus in creating new provincial parks was to promote recreation and enjoyment for all Albertans. While preservation of natural integrity was considered important, the main purpose was to provide people a place to enjoy nature in a less restrictive environment than the national parks. The first provincial park, Aspen Beach was created near Edmonton in 1932.

A new Provincial Parks Act was established in 1951 to provide some stronger guidelines for park administrators (Morrison et al. 1980). The prime direction of the policy was to create more protected areas that had less facilities than national parks and provided opportunity for inexpensive, rugged camping (Harvie 1969a). The new act also dealt with the fact that parks were becoming more popular and required a focussed management direction. Staff from the Department of Lands and Forest were put in charge of operating the parks. The department had a broad mandate which included many other sectors besides protected areas. Some of those interviewed felt that this was an early signal that the government did not hold parks in high regard and would shuffle parks on to different departments. In the following years, the parks portfolio would indeed be handled by many different agencies.

In 1958, 6000 acres of land were withdrawn from the Northwest Pulp and Power company to create a new park called Entrance Provincial Park. The park would be renamed William A. Switzer Provincial Park in 1974 for Hinton's first mayor and liberal MLA. The park was created to provide a place for people in the area to recreate and camp, and make use of the valley's interconnected lakes. The impetus to create the park came largely from a group of local citizens.

> *A group of citizens in the area looked at the place and thought that it would be nice to create a park for the people of the Hinton area to overnight camp. It was a water based park that was perfect for canoeing. The people wanted a park that was just for them, with more primitive type camping. It was to be for folks who didn't want the busyness of Jasper.*
>
> Provincial employee

There were few conflicts in the creation of the park, a trend that would be maintained for many years to come. Northwest Pulp and Power, now Weldwood of Canada, were happy to surrender the land to the province. They supported a provincial park that would concentrate recreationists and campers in one locale instead of having them dispersed over their managed forest lands. It was safer for logging operations and for preventing forest fires. The aboriginal people still living in the area were apparently not bothered by the new park either. They did not use the area extensively for hunting and the park occupied a relatively small land-base. Community members were happy to have a place that was closer and less expensive than Jasper.

> *There was really no conflict at the time the park was established. Des Crossley* (Chief Forester at Northwest Pulp and Power) *was happy to give up the piece of land for the park. There were only a few native people living in the area and they barely came into the park. Most of their hunting was in other areas. We actually had a real good relationship with them; sometimes they'd come work for us and we helped to restore and protect the gravesites at Jarvis.*
>
> Provincial employee

The trend for development of the early park was to build few facilities and maintain a natural, primitive character to the park. There were few regulations that initially arose from problems among park users. Management was handled very much on a local scale, where the park manager dealt with any issues that surfaced.

> *I could do whatever I wanted there. We had direction from Edmonton but we were on our own to manage the park right. The people worked with us and things went well. We had their respect and they also respected the park. Enforcing regulations was no problem.*
>
> Provincial employee

There was no management plan in place in the early years of the park, nor was there a set of goals to attain. Provincial parks policy provided no unified vision for parks and managers dealt with their area in ways they saw fit. One former manager told of how most local people did not want high-powered boats in the park but he was unable to prohibit them because this was handled by federal jurisdictions. To get around this problem he simply did not build major boat launches when requested, effectively preventing motorboats from accessing the lakefront.

The first major legislative change for provincial parks occurred in 1964 with the passing of An Act Respecting Provincial Parks, Historical Sites, Natural Areas, and Wilderness Areas. This act was a more comprehensive document than previous works and signified a broadening of the province's mandate (Swinnerton 1993). The province was facing similar issues to those occurring at the same time in the national parks; increasing pressure from recreationists impacting parkland. The new Act developed different categories for protection to capture the needs of the many different users. In 1967 the government launched its first policy statement, one with a much stronger protection clause than seen in previous Acts. The purpose of the parks was defined to preserve from impairment all significant objects and features of nature within the park while providing opportunity for recreational activities (Morrison et al. 1980). This policy was updated in 1973 with a document that called for more parks and more opportunity for recreation (Alberta, Lands and Forests 1973). The position taken in the policy was to encourage more nature oriented park use in harmony with the natural ecology and attributes of the region. The policy also stated that "provincial parks must be more accessible to Alberta citizens and visitors" (Alberta, Lands and Forests 1973:1). This document helped to create a vision for provincial parks that protected natural features but also provided places for enjoyment.

There were some changes in Switzer throughout the seventies and eighties that reflected this policy directive. In 1971 the Blue Lake Leadership Training Centre was built as a place to hold retreats for government workers. The first major campground at Gregg Lake was built in 1976 and had better facilities than previous, primitive sites for people to enjoy. Parks staff began presenting an interpretive program to educate and entertain campers. There was little controversy in the park and not much attention was given to the area. For example there were no briefs presented on the park or recommendations for management made during the public hearings on land use in the Eastern Slopes (Environmental Conservation Authority 1974). The park satisfied local users and managers experienced few difficulties. Park managers concerned themselves with administrative matters and maintaining the park facilities. They did not have management plans to follow or any major goals to achieve.

> *We didn't have any type of real management planning in those days. We kept the campgrounds clean and tried to keep people safe. We didn't worry about natural resource management much, except maybe if we had a bear problem or something. We just tried to keep on top of the things that needed attention.*
>
> Provincial employee

Public participation was through informal contact with campers and interested parties who chose to speak to parks staff. There were no major open houses or public forums because their was insufficient interest in park management.

The nineties did bring some changes to Switzer when the government undertook a decentralization of services and cutback of parks funding. This resulted in the loss of many specialized programs like interpretive services (Swinnerton 1993). A move from Lands and Forests into the Natural Resources Services and privatization of services furthered altered the park's mandate. The changes were made to reduce spending and make the parks more efficient in their use of resources. Reaction has been mixed.

> *The biggest changes in this park have happened in the last few years since we moved into the Natural Resources Service three years ago. It's tough to say if it's been bad or good for the park overall. Some things have gotten better, others worse. Things are run more smoothly now and we don't have time taken up by maintenance and service stuff anymore. We did however used to have much more staff such as more permanent employees, interpreters and seasonal rangers. The restructuring has made a much more efficient use of resources. We just need more resources.*
>
> Provincial employee

Restructuring made parks more efficient but the corresponding cutbacks have made management more difficult. Park workers must be generalists and balance many different roles thereby limiting their ability to focus on specific management prescriptions.

The environmental movement that so strongly influenced the national parks also affected management in places like Switzer. For example, environmental pressure on the government for the creation of more parks resulted in the initiation of the Special Places 2000 campaign. The goal of this project is to create protected areas to represent the diversity of Alberta's ecoregions. Another effect of increased environmental awareness was to shift the focus for management in parks and department funding to more strongly consider ecological concerns. Switzer has benefited from this because it is bigger than most provincial parks and is a valuable ecological site. Park managers are also looking beyond their borders to collaborative projects with other agencies.

> *We definitely deal much more with resource management issues now. We don't talk about maintaining ecological integrity because of our small landbase. More of what is happening outside the park effects the integrity here. Jasper can manage on an ecosystem basis but we can protect critical habitats. We have smaller ecosystems such as key nesting areas that are very important. We have to work with other agencies such as Parks Canada and the Model Forest. Foothills has been really beneficial to us by providing research and guidance for our management.*
>
> Provincial employee

> *We're trying to work more with industry now. Our relationship with Weldwood has been really good. They've done some special landscape management things for the park. They always come and tell us what they want to do even though they really don't have to.*
>
> Provincial employee

The public has more opportunity to participate in management directions now with the creation of the Friends of Switzer Park Cooperating Association. This group opens a line of communication between concerned citizens and park managers.

There are pending decisions at the time of this writing that will potentially affect management in Switzer. A management plan is being drafted to provide objectives and regulations for park management. The plan will be a useful tool in defining the role of the park and available management options. The proposed Natural Heritage Act may also affect management in Switzer (Alberta Environmental Protection 1998). This Act proposes to create a unified policy on all protected areas and designated activities permissible within them.

4.4. Willmore Wilderness Park

The management history of Willmore Wilderness Park is even less varied than that of William A. Switzer Provincial Park. Willmore is quite unique for a protected area in that there are very few accessible points and no motorized vehicles permitted. Willmore has very few visitors each year and most of these are horse outfitters and backpackers. Historically there has not been much use of the area in terms of industrial development either. Fur trappers and traders made use of the region's abundant wildlife species which they could trade at Jasper House. Many outfitters have led travelers through the rugged terrain especially in the period after World War II (Alberta Wilderness Association 1973). Today's travelers can still wander this wilderness area with very few restrictions or required permits. Managers of Willmore have intentionally imposed few restrictions to preserve a sense of freedom for recreationists. Many people spoke of Willmore very fondly and were satisfied with the type of experience it offered.

> *What I appreciate is that you can go in there without a plan and do what you want; fish, hunt, hike, ride horses. You don't need a permit that lets you stay longer or tells you where to camp. It's a privilege to have this place.*
>
> Willmore user

Willmore was designated in 1959 with an area of 5,570 km^2 under the name Wilderness Provincial Park. The name was changed in 1965 in memory of the Honourable Norman Willmore, former Minister of Lands and Forests. Willmore was a staunch supporter of conservation measures and helped to establish the wilderness park. To designate the boundaries and regulations of the park, an Act was designed exclusively for the protected area. The Act permitted hikers and horses to use the park but excluded motorized transport. Hunting, an activity generally prohibited in parks, was also permissible. The purpose of Willmore Wilderness Park was to have a protected area that was free of commercial development where people could pursue traditional outdoor activities. The Act did not however prohibit mineral exploration or the development of other industrial activities (Alberta Environmental Protection 1997). There was an unwritten policy among government officials that the region should not be exploited but this was not formally recognized in the Act. Management for the park was entrusted to the Department of Lands and Forests. This is the only major park in the province not administered by the Alberta Parks.

Two boundary changes in 1963 and 1965 reduced the park size to 4,597 km^2. Two parcels of land were removed from the park to accommodate a request to develop coal mining in the region (Willmore Wilderness Park Task Force 1973). This move angered many environmentalists and users of the park. The Alberta Wilderness Association generated a petition signed by more than 40,000 Albertans to protest any further development of the Willmore. There were others who felt that the park should include even more development. The Grande Cache Board of Administrators presented a brief at the hearings on the Eastern Slopes policy that called for more access to encourage tourism (Environmental Conservation Authority 1973). The Board also argued that more mining would help the region and that with more visitors, Grande Cache might become a resort town. However, the arguments for development of Willmore were few and no further leases were granted after 1965.

Lands and Forests did little active management in the Willmore during the seventies. The biggest interventions they made on the landscape during these years was to suppress forest fires. People began to notice vegetation changes such as meadows becoming overgrown with willows. A task force reviewed the state of Willmore in 1973 and concluded that fire management would have to be dealt with at some point (Willmore Wilderness Park Task Force 1973). The report presented a range of options for managers to consider implementing in the park. The authors also stated that the values of the park were incompatible with industry and therefore development should be excluded from the region. Management did not change immediately following this report. It was not until 1980 that there was another call to improve management and produce some formalized goals and management regimes (Alberta Energy and Natural Resources 1980b).

In response to the need for a more structured framework, a management plan was produced for the Willmore in 1980 (Alberta Forest Service 1980). The management plan included a detailed biophysical classification and scientific assessment of the park

(Alberta Energy and Natural Resources 1980a). Goals and objectives for the park were clearly defined but these were very much a continuation of the existing hands-off approach. A permit system was instituted to monitor the activities of outfitters and guides leading trips into the park. There were no restrictions placed on the number of permits nor was there much follow up on the data collection. The management plan also stated that continued forest protection was necessary to prevent a major fire or disease outbreak that would destroy a large part of the park or spread to adjacent land owners. After the management plan was released there was very little change in how the park was run.

> *There has never been much management action in the Willmore. It's intentionally been left alone. We react to problems if they have already started but there has never really been active management.*
>
> Provincial employee

In 1984, the possibility of industrial activity was effectively eliminated for the Willmore. Most of the park was categorized as Prime Protection under the Policy for Resource Management of the Eastern Slopes (Alberta Environmental Protection 1997). This designation precludes any extraction or development on those lands. The Willmore Wilderness Act was amended in 1995 to formalize the prohibition of all industrial activity as well as motorized vehicles.

The current managers of Willmore face the same issues of those in the past, though the situation may be becoming more serious. Numbers of users are increasing slightly and the vegetation changes are becoming more pronounced. Decades of fire suppression and horse use have drastically altered some ecosystems. Hiker's boots and horse feed have transmitted a series of exotic plant species that have taken a foothold in the park. In 1999, there was a minor outbreak of mountain pine beetle that may become a greater threat in the future. This beetle has had serious effects on timber in British Colombia and is a concern for forest companies in Alberta. Weldwood assisted the managers of Willmore in removing less than forty trees that were cut and burned in an effort to contain the problem. Managers have come to realize that more action will be needed in the future to deal with some of these issues.

> *There's a requirement to do vegetation management in there whether by prescribed fire or wildfire management. There are willow meadows that used to be open that you have trouble finding your horse in now. Management needs to maintain a range of natural variability, that should be the goal. We don't want to go start implementing regulations all over the place.*
>
> Provincial employee

In recent years, Willmore managers have taken advantage of the resources of other agencies through collaborative projects. They have instituted some joint horse patrols with Jasper and look to Switzer administrators for aid with enforcement and advice on protected areas management. The Foothills Model Forest has undertaken studies on wildlife and vegetation changes that will be of great help in managing Willmore. Weldwood has assisted with vegetation management and maintains an interest in the park's direction due to it's close proximity to their Forest Management Agreement area boundary. Because of its small compliment of managers and limited budget, collaborations with outside agencies are particularly useful for a place like Willmore.

> *We make use of outside help whenever we can. The Model Forest has been really good by looking at things that we would never have the budgets to do. Their work will help us plan future vegetation management. We have a lot to gain by talking to our neighbors.*
>
> Provincial employee

Future management may change if the park is incorporated into the new Heritage Act. The park would no longer be managed under a separate act and would fall under control of the Natural Resource Service.

5. DISCUSSION

5.1. Meeting the Criteria of Adaptive Management

This section will review the evolution of the areas described in the previous chapter to condense the historical information in order that some initial conclusions may be drawn on each region's ability to manage adaptively. The regions are considered together in order to make comparisons on the basis of the defined criteria of adaptive management. This first section is intended to cover the basic elements of the adaptive management cycle and does not describe in detail how management evolved. The following section presents an analysis of the evolution of the types of adaptive management practiced in each area. Concepts presented in the literature review are reintroduced to help explain how the current management situation evolved. Section 5.3. expands this discussion by presenting challenges for adaptive management of protected areas. The final portion of the chapter considers the role of the Foothills Model Forest in potentially improving ecosystem and adaptive management.

One of the most basic criteria of adaptive management is setting clear objectives that are defined in policy and legislation (Lee 1993). This is a key component in the planning stage of the adaptive management cycle (Bormann et al. 1994). The history of protected areas management reveals that it is often very difficult determining not only short-term management goals, but also a broadly defined vision. This is seen in the classic dual mandate debate of use versus preservation of parks. In the FMF region, the managers of Jasper National Park have struggled the greatest with this dilemma. The early history of the park shows a trend where legislation called for protection of resources but management sought to promote a business presence in the park. This trend continued well into the 1960s and often led to unclear management objectives because opposing forces in the park believed in different management paradigms. In the other two protected areas, there were more clearly defined sets of management goals. The managers of William A. Switzer Provincial Park ran their park in the manner that had been defined for the entire Alberta provincial park system; the promotion of tourism. This desire was tempered by a realization of the value of resource protection but managers knew that they provided a place for recreation and camping. The vision of an unspoiled wilderness playground has always been well defined for the Willmore Wilderness Area. The park legislation clearly supported this concept and very few people have argued against it.

Another element of the planning stage of the adaptive management cycle is to examine a host of options for any management action. As management in Jasper evolved, this became a more prominent feature in decision-making. The management planning processes of the 1980s outlined a series of options for managers to consider. At the same time, legislation was strengthened to provide a more defined set of guiding principles. The management plan of 1988 more clearly articulated management goals and strategies to achieve them. The proposal for the 1998 plan contains an even more comprehensive set of options that managers can potentially select from after public consultation and scientific assessment. While the provincial protected areas have enjoyed well defined goals, there is less evidence that they considered a range of management options. Managers of Willmore have been especially hands off, expressing little desire to investigate a range of management alternatives. In Switzer, new management options have rarely been investigated or rigorously tested, largely because managers do not have the resources for this type of research. Policy for the park system was defined by the provincial government but day to day management was largely the responsibility of the few people running the park. These individuals could choose from options that they discovered based on issues that arose in their jurisdiction.

An important method of identifying management goals for effective adaptive management is to include the views of members of the general public into planning and decision-making (Forest Ecosystem Management Assessment Team (FEMAT) 1993). The previous chapter revealed that Parks Canada did little public participation in its early years. There were infrequent public planning sessions and these tended to inform the public rather than to consult them. After the Lake Louise ski resort development incident, Parks Canada became more concerned about the appearance of public consultation and began to host open houses. It was not until the mid-1980s when many felt that Parks became serious about meaningfully engaging the public. The Jasper Core Concept and the Jasper National Park Management Plan are both examples of managers trying to more effectively incorporate public concerns. While this trend has continued into the nineties some are still concerned about how the public process can be ignored in the ultimate decision. The most obvious example of this occurred in 1998 when the two-year town visioning process was overturned by the federal government when Parks placed a moratorium on new developments. People are concerned that while Parks Canada does consult the public, this input is often disregarded when decisions are actually being made at the federal level.

There are no formal public consultation schemes in place in either Switzer or Willmore. It is quite difficult for members of the public to give feedback to Willmore managers unless they write or call their local politicians. The major incident of public involvement in the region's history occurred in the 1970s when the Alberta Wilderness Association presented its 40,000 signature petition to keep industrial development out of the park. It is likely that few people would choose to participate in management planning for Willmore as the park receives minimal visitation each year. Managers of William A. Switzer Provincial Park intend to consult the public formally with the development of their new management plan although none has occurred in the park before this time. Consultation has always been a matter of personal encounters between park staff and users. One new avenue where the public can be involved in park management is through the Friends of Switzer Park Society. This group is comprised of interested members of the public and a representative from Switzer Provincial Park itself. The group meets to discuss park management issues and provide feedback and ideas to park managers.

Adaptive management should not only consider the public's knowledge but also that of other experts. Agencies practicing adaptive management seek partnerships with other organizations to improve information flow and to manage on an ecosystem scale (McLain and Lee 1996). This can be particularly critical in protected areas management as these places are islands of conservation in a mosaic dominated by resource extraction. Historically the protected areas in the FMF have not extensively joined together in management planning. Managers in Jasper for example have not consulted with mangers in Willmore, Switzer or local industries such as Weldwood when planning management actions. In recent years they have come to realize the importance of looking beyond their boundaries and have initiated more communication through efforts such as the Foothills

Model Forest[2]. The two smaller protected areas have used and benefited more from cooperative efforts than Jasper. Managers in Willmore have pooled resources from different government agencies as well as from outside industries. They have received research information and support from the Model Forest and Weldwood.

Once management objectives have been articulated, options researched and implemented, the results must be monitored to provide an opportunity for feedback and adjustment. This feedback and adjustment must occur quickly and freely to provide for what Bormann et al. (1994) call 'rapid learning.' This has often been a stumbling block in the three regions because monitoring progress is difficult and expensive. Protected areas managers generally deal with insufficient budgets to have comprehensive monitoring systems. In Jasper, many interviewees complained about the lack of monitoring throughout the park's history. Research budgets were very minimal and could barely cover investigative projects, let alone long-term monitoring. Some managers feel that research conducted by the Model Forest may help to remedy this situation. There is however, a system in place to allow feedback and adjustment from the ground staff. When the public has a concern or wardens discover an issue in the field, the superintendent has the power to make changes. This can been seen in small-scale management decisions such as closing a portion of Pyramid Lake to protect a nesting Common Loon or on a larger scale such as launching an assessment of Harlequin Duck breeding success. The flexibility of this system has been shown to break down when decisions must go to higher levels of management or when certain managers do not perceive an issue to be serious. This will be discussed further in section 5.3.

Because ecosystem management is less of a priority or a possibility in Switzer than in Jasper, there is less of a need for extensive monitoring. Managers of Switzer do not deal with many of the major landscape issues that administrators face in Jasper. Monitoring of park issues and management actions is done on a much smaller scale through direct observation and public interaction by park staff. On-site managers have the autonomy and flexibility to make changes as they see fit when issues arise. Even less monitoring and adjustment takes place in Willmore. Managers do not carefully keep tabs on the number of users in the area or their effects on the landscape. Until this year there has not been an individual patrolling the park who could provide firsthand accounts of activity in the region. There have been major vegetation changes in the park but no one knows the full extent or ramifications of these modifications. Because of its vast area, there could be many negative changes happening in Willmore that could be addressed with new management options.

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[2] See section 5.4 for a more extensive discussion of the value of the Foothills Model Forest in promoting adaptive management.

This section reviewed how the managers of each protected area have fulfilled the criteria of adaptive management within their own jurisdiction. Adaptive management schemes could also be especially useful in expanding the scale of management to look at how each management zone fits into a broader picture (Walters 1997). For example, managers in Willmore may make few prescriptions on the landscape but the park itself may be beneficial in providing benchmark data for surrounding agencies. Each management jurisdiction in the Model Forest can contribute information by treating their resource as part of a larger experimental management process. It appears that while the Model Forest participants do share information on resource issues, more work can be done to regard the landscape as a mosaic of experimental opportunities.

5.2. Type of Management Practiced

In chapter 2, three types of adaptive management as defined by MacDonald et al. (1997) were discussed; reactive, passive and active adaptive. These three types of management can be thought of as occurring on a continuum of complexity (Figure 5.1.) Reactive adaptive management requires far less resources than active adaptive management because fewer options need to be investigated and management actions are not extensively monitored. On a landscape scale, an active adaptive management strategy offers the best opportunity to take advantage of different resource use patterns. Any one particular resource management agency wanting to implement a type of adaptive management must choose which strategy is most effective based on the agency's goals and available resources. It may be most effective to implement a reactive adaptive management if there are no great pressures on the landscape or the costs of active adaptive management are too high. In this section, each protected area will be described in terms of the type of management practiced in its historical development. One region

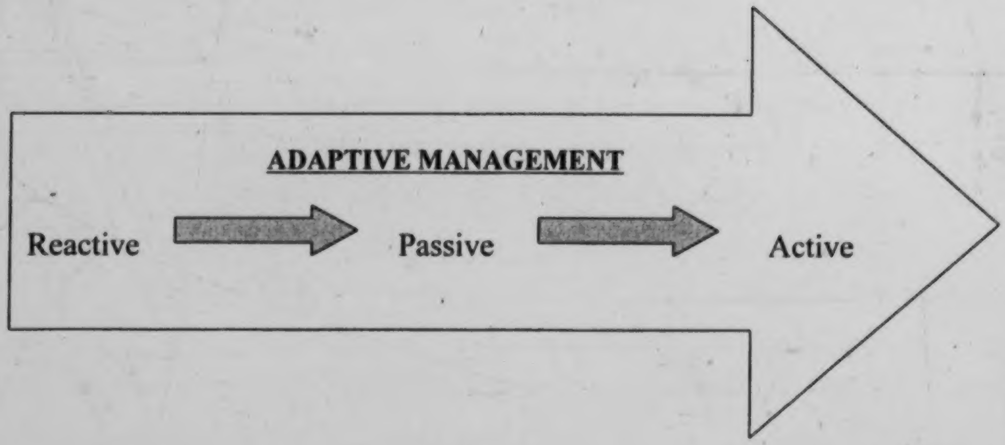

Figure 5.1. Increasing levels of adaptive management

may go through several types of management in its history as values and resources change.

5.2.1. Jasper National Park

The early management practices in Jasper National Park were quite reactive. From the creation of the park, the policy and legislation structure did not produce a system that was flexible and responsive to change. In the early years of parks, this was not necessarily problematic because there was not the diversity of users or pressures on the landscape. Managers did not have the wide range of issues to consider that today's managers face and could afford to react to situations as they arose. Biological study was in its infancy and park managers were not yet aware of concepts such as landscape ecology. The National Parks Act did present a set of objectives for management but these were largely open to interpretation. While the early legislation appears concise and well written, managers in individual parks were able to enforce their vision of what they believed their park's mandate was. Not only was there room for interpretation within the Act, but there were also no written, national policy documents produced until the 1960s. It was in these early years that a pattern began to emerge where different influences were able to steer management directives. Sometimes this influence came from within park management as people changed positions within the organization. For example, if a new superintendent felt strongly about horse use where his predecessor did not, regulations may have changed to benefit outfitters. Positions in the organization were not always clearly defined, thereby opening the possibility for each individual to greatly change the direction of their portfolio.

The 'provide enjoyment' and 'political control over policy' continuums as described by Freemuth (1989) were the steering forces in Jasper's early management. While there was a strong preservation message in the early legislation, the main focus of politicians was to generate revenue from tourism. Local businesses were able to easily influence park managers partly because of their close proximity with superintendents as they lived together in the townsite. Dearden and Berg (1993) demonstrated how business interests dominated the policy agenda and were able to guide management in their favor because their goals were often compatible. This is an example of what West (1994) terms cooperative domination. The goals of an outside constituency, in this case corporate interests, were in line with the governing bodies' goals and this constituent was therefore able to capture the agency. In the early years of parks this was less of a serious issue because so few people had any other suggestions for how the park should be run. In the years following as more people became interested in the preservation values of protected areas, Parks Canada was not able to respond to arising situations with a full range of management options. This is an example of a society-centered view of state autonomy because the organization had become locked into a pattern of action with the business constituency.

Up until the late 1960s, managers mainly reacted to different situations that arose within the park. There was little effort to make predictive models of how an action might affect future conditions. Decisions were made without performing research and creating a set of goals and actions. This is largely a result of the lack of scientific information available in those years. Managers in the first half of the century did not have the wealth of information that today's administrators have at their disposal. They were not concerned with looking beyond their borders to collaborative efforts with other agencies because they felt no need to do so. Sciences such as conservation biology and landscape ecology were not even in existence at this time. In this era, a reactive management was sufficient to manage the resources of Jasper National Park. One particularly strong aspect of the structure in those days was that decisions were made much closer to the park. The superintendent and wardens were able to quickly react to issues because much of the political power was located within the park boundaries and not at higher bureaucratic levels. There was less risk of running into the problem of bureaucratic slippage because there were less steps in the bureaucratic chain where management decisions could be altered.

One impediment to adaptive management that began to take shape in Parks Canada was the formation of a type of epistemic community. In Chapter 4 it was shown that wardens became very possessive of their region and shared great camaraderie and a unified way of thinking. Superintendents and wardens often came from comparable backgrounds and shared similar views on how the park should be run. In Haas's (1992) conception of the epistemic community, members of the community share a similar notion of scientific validity and a common policy enterprise. In the case of Jasper, managers were unified by what today seems like a romanticized version of the park warden patrolling the backcountry. The formation of this common mind-set, coupled with the external control of business interests made change very difficult and slow in Jasper.

Management in Jasper was able to move from a reactive framework to a more passive adaptive approach from the early 1970s until the late 1980s. Environmental pressure began to refocus the organization on what it was legislated to perform; preserving the park for future generations. The grip of the business community was somewhat reduced and managers looked to new options. Parks Canada shifted more from a society-centered autonomy to a contingent autonomy where more diversified views were considered. The organization developed policies that provided a clearer direction and sets of objectives for managers to follow. Throughout the eighties there was more public consultation and eventually the creation of management plans. This provided a more structured policy framework within which ground level management decisions could be made. There was also more research in the park through those years as scientists tried to understand the ecology of the park and how humans were affecting it.

Management must still be considered passive in this era for a number of reasons. There was little commitment to establish rigorous monitoring as a major component of the system. Decisions were still made mostly on an ad hoc basis and were reactive to arising issues. Parks Canada did not actively try to form alliances with organizations outside their boundaries to broaden their scope of management. Overall the system remained fairly inflexible due to the established patterns of thinking in the organization. Scientific studies of the park's resources were collected in a piecemeal fashion. Managers were not trying to connect the pieces of the puzzle and manage on an ecosystem basis nor did they attempt to predict the cumulative effects of human uses. Political pressures still greatly influenced the process of decision-making. Park users and managers complained about how one never knew how policy and regulations would change as individuals changed positions in the organization. In addition, with the creation of the regional office in Calgary there was another bureaucratic layer where directions could be changed, increasing the chance of bureaucratic slippage. Former managers continually spoke of how they tried to move forward on a directive they believed was crucial to the park only to have their work weakly followed through at a higher level or changed completely by administration. According to one current employee:

> *There were some fierce political battles. Decisions were often made at the regional office. If one of those directors happened to be pissed off at the superintendent of Pacific Rim for some reason he may not necessarily have gotten funding to do his research projects. You never knew how any decision may go because it could be overturned at any time. Too often I saw good initiatives get slowly changed piece by piece as they went up and down the chain of command. In the end some things were so whittled away they were useless or even worse; they were totally opposite to what they were originally intended to be.*
>
> Parks Canada employee

In the nineties, while there has been a definite transition in the way Parks Canada is managing the National Parks, many people are still concerned with the political posturing that has been so prevalent in the area. It is still possible for programs to be changed by new personalities and political realties both within Jasper and in the regional and federal offices. It is also still difficult for managers to implement effective monitoring schemes due to lack of funding. Despite these setbacks, most respondents felt that Parks Canada is becoming an active adaptive organization. With a strongly revised National Parks Act, a new management plan, and CEAC legislation requiring environmental impact assessment, Parks Canada has the tools it needs to have flexible, adaptive management. The agency is much more concerned with incorporating public participation into its planning process as well as information from non-park sources. By participating in the Model Forest program, Jasper managers have formed new alliances with surrounding protected areas and with industry partners such as Weldwood. Parks Canada now has better scientific information and is becoming more committed to using this knowledge to manage on an ecosystem scale.

> *I think we are adaptive; some parks are way ahead of others. Management is improving here much more. We're now looking down the road to potential effects of things like the twinning of the Edmonton highway which may happen within 20 years.*[3] *We have the legislation, we have the policy. It's all there. It's just a matter of getting things done.*
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> Parks Canada employee

5.2.2. William A. Switzer Provincial Park

Management in Switzer Provincial Park, while not fully adaptive, is also not purely reactive. Managers in Switzer deal with a much different set of circumstances than do managers in a National Park or other resource management agencies. There is less of an opportunity to design predictive models and monitor their effects because managers are dealing with a much smaller land-base and a different set of objectives. The most pressing issues in Switzer generally involve recreationists and providing services to them. While managers have not had the opportunity to implement major research programs, they do react to change quickly and design effective strategies. Therefore a type of passive adaptive management is practiced in the park.

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[3] **The Jasper-Edmonton highway is a four-lane, divided highway except for the portion within the Jasper boundary where it is only a two-lane highway.**

Managers in Switzer have a positive situation for implementing adaptive management because they have local control over decision-making within a defined framework of policy and legislation. Provincial Park policies in Alberta are determined by the government department responsible for parks with input from ground level workers. The Act clearly defines what is acceptable and encouraged for management of the parks. The managers of Switzer are able to take this framework and tailor specific park policies to fit into this vision. Those interviewed did not feel overly constrained by political influences on their ability to run their park. There is far less bureaucratic slippage in Switzer's management than in Jasper's because local park managers do not need approval for every management decision. There is still a political dimension to their work, a situation unavoidable in any organization. A key difference in Switzer Provincial Park from Jasper is that managers have relative autonomy over management of their park. They can react quickly to arising issues and are able to anticipate future changes because they are intimately involved in the park setting. They are also willing and able to maintain relations with other management agencies in the area and participate in collaborative works.

This autonomy over management is enjoyed not only within the provincial management structure but also in regard to external influence. Managers in Switzer do not have a townsite located within their boundaries as Jasper does. They also do not face pressures from national and international interest groups who want to influence park management. The management of Switzer has never been captured by one interest group, a situation that makes management much less complicated. Managers in Switzer do appear willing to include public participation in their management decisions to ensure that all interests can be considered. This is an example of a state-centered agency that is willing to accept the views and help of external influences without relinquishing control over management decisions.

What prevents management in Switzer from being termed active adaptive is that there is little opportunity to regard many options in a predictive model of anticipated outcomes. Management decisions must generally be in response to specific issues that arise in the park. When a decision is made in the park its effects are monitored by field staff and may be changed at a later date as circumstances change. Managers learn from effects of their actions and can alter subsequent strategies based on this new knowledge. There is opportunity for 'rapid learning' because of the small size of the park and because workers are there to witness effects of their actions. This type of passive adaptive management works well in a park that does not have the resources or size to be concerned with an intensive, active adaptive management approach. In the future, management in Switzer may become more actively adaptive as a new management plan is being designed. This plan can outline a more formalized course of action that can be more rigorously monitored. However, a management plan will not ensure that managers investigate predictive models or seek public input or external agency collaboration.

5.2.3. Willmore Wilderness Park

Management in Willmore must be considered reactive because there are few measures taken to anticipate change. The management of the wilderness park is very hands-off; few interventions are made in the park's ecology or among the users that visit there. The only management actions that are taken are in response to specific situations such as was seen with the Mountain Pine Beetle outbreak in 1998. The guidelines for managing the park call for preserving the park with minimal human interference. Beyond this guiding principle there are few other prescribed goals or sets of management options to consider when making decisions. There has not been extensive information gathered on the park to assist managers nor are vegetation and wildlife changes monitored. The basic philosophy of the park virtually precludes any type of active adaptive management. A reactive or passive adaptive approach works in Willmore because managers do not face the complexity of options nor do they have the resources to meet the costs of active adaptive management.

Managers in Willmore of course do take some actions and recently these are pointing towards a more adaptive approach. The park has greatly benefited from research conducted by the Model Forest and its partners. There are continuing studies to measure vegetation changes and impacts of fire suppression. Plans are on-going for the preparation of a new management plan that should define objectives and actions for the park. Nineteen ninety-eight marked the first year where a ranger patrolled the backcountry and could provide feedback for policy makers. While these actions are more in line with an adaptive approach, it is unlikely that active adaptive management approach will be implemented in Willmore.

5.3. Challenges To Adaptive Management

The management history of the protected areas of the Foothills Model Forest reveal that there are many possible impediments to adaptive management. There are certain conditions and situations that arise that prevent the successful transmission of information in an organization. There are also forces acting from outside an agency that may direct policy in a manner beneficial to them and not a broader constituent. Many of the impediments to adaptive management described below are a result of bureaucratic slippage in the organization. The following section summarizes some of the lessons learned from the study of the protected areas of the FMF to highlight pitfalls that may be avoided. A summary of the challenges appears in Figure 5.2.

A primary challenge to an agency's ability to practice adaptive management will arise if the organization does not possess a strong vision. The discourse surrounding protected areas management inevitably turns to the debate over the dual mandate of use versus preservation. Parks have many different and often incompatible values for members of society. Freemuth (1989) demonstrated how various actors believe that parks should be run by either experts or politicians for the purpose of enjoyment today or future preservation. In Jasper, for example, many local businesses would like to see local, political control over a park that promotes tourism values. Park managers would

Nine Challenges for Adaptive Management

1. Unclear agency vision
2. Insufficient policy structure
3. Closed agency culture
4. Positional power not well defined
5. Excessive bureaucratic control
6. Influence of political forces
7. Interagency politics
8. Agency capture
9. Increasing pressure on parks

Figure 5.2. Challenges for adaptive management in protected areas

prefer to see their scientists make decisions that protect the ecological integrity of the landscape. The environmental community generally prefers preservation values but many people also enjoy the park for its recreational opportunities. For some environmentalists it is unclear whether expert of political control over policy will better protect conservation values. One of the unmet challenges to adaptive management is to find ways of accounting for the multiple benefits that users seek from protected areas (Lee, 1999). The dual mandate debate will always exist in parks because people will inevitably disagree over how protected areas should be managed.

The problem this presents for protected areas agencies is when people in the organization do not share a basic vision of the agency's goals. All three of the protected areas in this study demonstrated evidence of this phenomenon with managers in Jasper in particular struggling over the meaning of the park. Many of those interviewed felt that the Parks Canada had not clearly stated what its purpose was but rather changed direction when it was politically convenient. Management became quite difficult in this atmosphere of uncertainty as employees were never confident how to proceed on a particular issue because they had no clear set of objectives. In contrast, Willmore Wilderness Park has a very clear vision and employees have worked to maintain this when managing the park. Ideally, adaptive management should help to resolve dual mandate issues but it is also important for an adaptive organization to set clear goals based on a sound vision of the agency's purpose. Without adequate goal setting it is impossible to identify management options, monitor success and subsequently make adjustments.

A second challenge to adaptive management that can result from a lack of vision occurs when the policy and legislation framework is not adequately structured. It is useful when policy and legislation documents clearly specify management goals, objectives, and potential strategies to achieve them. Managers and the general public must know the framework within which they can work to be able to identify management options. The framework must hold people accountable to the process and make key elements of the legislation enforceable by law. Through most of Parks Canada's history there was a lack of enforceable guidelines. Policy 'suggested' courses of action and stated that superintendents and other managers 'may' make regulations as they chose.

These types of statements do not enforce courses of action and leave room for loopholes in the legislation. They may also contribute to bureaucratic slippage because there is room for subsequent interpretation of decisions by different levels of management. Legislation should not, however, be so restrictive as to stifle new management options from being uncovered because managers are forced into only one course of action. The Canadian Environmental Assessment Act is a good example of legislation that defines procedures that must be followed when approving new developments. This piece of legislation has had a profound impact on park management by making managers more accountable for their actions.

A close-minded agency culture can also inhibit effective adaptive management because it prevents the organization from responding to new options. When many of the employees in an agency share similar backgrounds and values there is a tendency to begin to think in the same fashion. These groups within the organization may begin to dominate the policy agenda despite the fact that their values do not represent the majority opinion or the park mandate itself (Vandlik 1995). An epistemic community as defined by Haas (1992) can steer policy in its desired direction and restrict the development of new policy options. A closed agency culture will not be receptive to new ideas and could disregard public input gathered from consultation exercises. It is desirable to have park employees that represent a diversity of academic backgrounds to inject new ideas into an organization (Chase 1987).

A key challenge to adaptive management in Jasper National Park has been the constant change in individuals who occupy the same position but who hold very different views on management. People have been able to change policy direction because power in the organization can be captured by strong personality and is not tied to a particular position. Numerous examples of this were presented in Chapter 4 where a new person came into a position and changed the focus of the department based on their own values. This constant shifting of individuals and power can increase the likelihood of bureaucratic slippage because it becomes easy to derail policy decisions. Any individual can attempt to change management based on their ideals or those of an outside source. This also increases the opportunity for an external constituent to dominate the policy agenda if they can establish ties within the organization. While it is fair and important that people have freedom to perform their jobs with a degree of individuality, it can hamper adaptive management if they are able to alter key management objectives to suit their interests.

One of the great advantages for management in places such as Switzer and Willmore is that the local management team have autonomy over management decisions in their parks. They do not have to filter management choices through a complex layer of bureaucracy but rather can respond quickly when needed. In these two parks, there is a legislative framework in which managers must operate and to which they are accountable, but they can more quickly make changes than managers in Jasper. In Jasper there is a hierarchy within the park, a regional office in Calgary, and the Parks Canada branch of the Department of Heritage in Ottawa. This has often reduced the effectiveness of management due to bureaucratic slippage. Several times in this thesis it has been demonstrated that in the time between policy planning and implementation, management directives can become drastically altered from what they were intended to be. Federal officials in Ottawa may make changes to a policy created in Jasper to suit their interests and not those of the park ecosystem. This process of bureaucratic slippage can reduce policy effectiveness and slow the time of reaction for decision-making (Freudenburg and Gramling 1994). The possibility of agency capture also increases with more bureaucracy because there are more areas where an external constituent can try to influence the process. An interest group can apply pressure or work on political levels that go far beyond a park's boundary. It is important that local managers have strong input in all management planning because they are most familiar with the park from personal and professional experience. This is not to say that one individual local manager should be given a free reign because decisions may then be made from personal bias and not agency goals. Rather, input should come from a diversity of local managers and employees who work in the park.

The above challenges to adaptive management all relate to internal forces within an organization. It is also possible that the entire organization itself is used as a political game-piece. Parks Canada, for example, has been transferred into many different departments in its history, generally being grouped with other resource agencies that have a higher priority to the government. Also, with changes in governments there can be drastic changes in park policy as bureaucrats try to showcase party platforms in the region's parks. In Alberta, the Progressive Conservative party has pushed for less government control and decentralization of regulations, resulting in privatization of some of Alberta's protected areas or services within them. Individuals within the governing party may try to boost their personal image by making bold changes. Many people felt that Sheila Copps was trying to raise her personal profile and make a statement when she declared a moratorium on development and closed the Maligne River to rafting. Whether this was the case or not, the possibility definitely exists for this type of action that can impede adaptive management. If government leaders use parks as political tools, the ensuing changes in focus will make it difficult for managers to run their parks consistently.

A key aspect of adaptive management is looking beyond your own boundaries to manage ecosystems in partnership with other agencies. This has been largely absent in the three protected areas of this study. It is impossible to truly manage adaptively if one does not cooperate with surrounding agencies because various species travel across political boundaries. Building collaborative approaches is difficult because many agencies do not want to compromise their independence in decision-making (Cortner et al. 1996). They fear losing power if they get locked into binding decisions resulting from group negotiation. Many agencies feel possessive of their resources and do not want to be told by neighboring, or even competing organizations, how to manage them. A host of agencies managing a landscape may also increase bureaucratic slippage because the various organizations can interpret policy differently. It has been shown in this thesis that slippage can occur within a single organization but this can also occur with poor communication between agencies with different mandates. Breaking down these barriers is one of the biggest challenges in adaptive ecosystem management because the institutional structures are rigid and difficult to change.

One of the major themes developed in this thesis that is a major barrier to adaptive management is agency capture. It has been shown that throughout the history of Jasper National Park, certain interests groups have been able to dominate the policy agenda through political pressure. The business community has had a large degree of influence not only in Jasper but in Parks Canada in general (Dearden and Berg 1993).

When an agency is captured by an external constituent, the agency cannot manage adaptively because it is no longer searching for alternatives. It does not consider a range of options nor will it meaningfully consult the public. West (1994) warns that capture through cooperative domination, such as in the case of Jasper, is especially difficult to penetrate. Managers in Switzer Provincial Park have a clear advantage over Jasper managers in that they are not constrained by the influence of any one particular group. Of course Switzer does not possess nearly the same business development opportunities nor does it have a townsite located within its boundaries. Many Jasper residents have made significant investments in park businesses and depend on the flow of tourists for their livelihoods. It is difficult for superintendents and wardens who live as neighbors with these people to refuse their requests for more developments. Management decisions must be made in an open environment considering what is best for maintaining ecological integrity and the diversity of human uses.

The final impediment to adaptive management to be discussed here is the increasing pressure on protected areas from human uses. Every year the number of visitors increases in these three parks and the strain is beginning to show. For example, the cumulative effects of human encroachment in the montane ecoregion of Jasper is of great concern to park managers and environmentalists. This valley bottom zone comprises only 7% of the park area and yet is critical habitat for many wildlife species. Unfortunately this is the zone with the most human development including the townsite of Jasper, the park highways and many outlying accommodations and campgrounds. There are pressures from outside these parks as well. Each of the protected areas has, or may soon have, industrial developments right up to edge of their boundaries. This raises concern over pollution of watercourses, disruption of wildlife movements, and loss of aesthetic values for recreationists. The basic role of managers of protected areas is to deal with this variety of human use on the landscape. Adaptive management may be an effective way to deal with some of these concerns but it is also this great demand of human utilization that will challenge their ability to manage adaptively. It will be difficult for park officials to generate management options when there are so many variables to consider.

5.3. The Foothills Model Forest

To this point of the thesis, the Foothills Model Forest has not been discussed in detail as a discrete management unit. This is because the Model Forest has no management jurisdiction of its own but is rather a research organization that brings together agencies interested in forest management. Yet it is important to examine the Model Forest on its own because it plays a significant role in resource management in west-central Alberta. The FMF can do much to advance the practice of adaptive management of all three protected areas and industries within its boundaries.

One of the greatest strengths of the Model Forest is that it brings together many different government, industry, and community groups. These groups can meet to exchange information and learn about the management practices of their neighbors. It has been previously shown here that breaking down borders between agencies can be difficult due to rigid institutional structures and the unease of some organizations to let others impact their resource decision-making. An organization like the Model Forest can ease this tension and open the door for collaborative work that broadens any one agency's scope to a broader, landscape level. By working together, the different jurisdictions can set complimentary objectives that account for wide-ranging species or processes requiring vast tracts of land. The research performed by the Model Forest can be a benefit to all the agencies especially some of the smaller ones with lower budgets than Jasper because they are not able to do this alone. Willmore for example, will benefit greatly from the research currently being conducted on fire history and vegetation change.

In addition, the Model Forest provides opportunities for long-term monitoring of the impacts from different interventions made in the landscape. This can be particularly insightful when comparing the ecological effects of timber harvesting with the relatively undisturbed environments of protected areas. One of the strengths of adaptive management is that it encourages experimental management that makes use of bioregional diversity (Lee, 1999). While managers in the Model Forest are making efforts at sharing information there appears to be opportunity for more experimental management that compares protected areas with more manipulated landscapes. The

Model Forest does offers much hope to improve the information flow between agencies and advance understanding of the most effective way to manage the ecosystem.

While Model Forest participants are encouraged to adopt new practices, there is no commitment required of its members to follow certain courses of action. There is no policy or legislation requiring an agency to adopt codes of practice or agreed upon resolutions. Each organization is still essentially free to follow its own will and can ignore the research if it chooses. This is however, made more difficult because the Model Forest opens up the process of forest management and puts practices more in the public eye. The main benefit of the FMF, improving information flow, can still be thwarted by any organization's refusal to participate. Even though agencies communicate more frequently in this forum, they may not be willing to make meaningful changes in their practices to incorporate landscape planning issues. As one participant in the Model Forest put it:

> *To some extent, the Model Forest is missing the boat for adaptive management, largely because we haven't seized the opportunity that it presents. We have to tie management more directly to the indicators that we set and the effects of our actions on the landscape. I still don't see this information being sufficiently incorporated into our management plans. We aren't monitoring properly. We're doing some things with prescribed fire right now that present some unique opportunities to integrate research and direct management action that could incorporate different agencies; Weldwood, Parks Canada and others. We're not doing it to its potential.*

This statement reveals that the Foothills Model Forest does in fact offer much to the practice of adaptive management, but more work can be done to realize its full potential.

6. CONCLUSION

6.1. The Effectiveness of Adaptive Management

Adaptive management is still an evolving concept in the literature but there are several key elements common to most definitions. Adaptive managers must try to anticipate future conditions in their jurisdiction and choose from a range of options that will best cope with uncertainty. Under an adaptive regime, monitoring is built into the management scheme to provide quick feedback and adjustment in order that changes can be made rapidly. This is a key element of adaptive management as managers must be prepared to make changes to their original ideas as new information becomes available. Managers can never have a complete knowledge of how ecosystems function and must take every opportunity to learn from their actions. Adaptive managers are not afraid to take risks but will explore every possibility that may improve resource use. The public is consulted throughout an adaptive process to inform managers of society's desires and goals for resource allocation. Ultimately, information flow is improved both within the organization and with outside agencies as new alliances and cooperative efforts are made. Adaptive management offers hope in breaking down traditional forms of resource management where administrators are continually reacting to crisis and changing societal values.

There are however limitations to the effectiveness of adaptive management itself. There is little hope that it will succeed without a strong commitment from agencies to make real changes. This is difficult because traditional forms of management are ingrained within the structure of most organizations and implementing a new system challenges and even threatens current managers. Adaptive management cannot solve many of the 'wicked' problems associated with resource management. Managers and the general public must still confront the value system of resource decision-making such as the dual mandate debate over protected areas. Another potential drawback to adaptive management is that it could provide agencies with an excuse to implement controversial actions. For example, a natural gas company may face opposition in exploring in an area because it is sensitive wildlife habitat. They could potentially run seismic lines through the region by claiming it necessary to measure the development effects on wildlife for adaptive management purposes. Finally, adaptive management risks becoming just another buzzword in the resource management vernacular. Agencies may try to justify that just about any type of management is adaptive because they are getting response from the system and making changes. Adaptive management must be recognized as a process of anticipating change and dealing with future uncertainty instead of reinforcing traditional management structures, or experimenting with park landscapes without thorough consideration of the park's mandate and accountability.

6.2. Adaptive Management in the Foothills Model Forest

While adaptive management was never a specific goal for Jasper National Park, William A. Switzer Provincial Park, or Willmore Wilderness Park, it is useful to look at their history to see if management was evolving in this direction. Examining historical trends can provide an agency the perspective of how current management situations came to be. Managers can see the direction the organization is taking and what elements of its structure inhibit effective management. The management history of these three protected areas shows that operations can change dramatically over time and that certain barriers may prevent adaptive management. Each region may be able to learn something from the other's structure to improve management in their park and in the foothills landscape in general. The following reviews the type of adaptive management practiced in each region with comments on situations where each type of management may be appropriate.

The managers of Willmore Wilderness Park have taken a reactive approach to management because they do not face a multitude of demands on their resources. Willmore has intentionally been managed with few interventions and where there is little evidence of human manipulation. A reactive type of management has been appropriate in the area because managers are committed to maintaining a wilderness experience for users. Managers do not feel it is necessary to implement a more active approach just to demonstrate that they do have a presence in the park. Also, the park does not have a large budget that could be used for identifying management options or monitoring the results of programs. Therefore, little effort has been invested into anticipating future conditions or monitoring park resources and the recreationists that visit there. Managers make very few changes to policy and only when it is necessary to react to a specific problem. The legislation that was designed specifically for the park has ensured its wilderness status with tight guidelines to restrict certain types of access. Historically any deficiencies in the legislation were accounted for with unwritten policy that precluded further development. The other protected areas of the study could benefit from the same type of strong mandate that exists in Willmore, although areas such as Jasper, this is complicated by the multiple clienteles that must considered.

Willmore managers have taken some steps that reflect elements of a more active adaptive approach. They now participate in collaborations with other agencies and this will help them greatly because they do not have the budgets to monitor their resources. Monitoring will likely become more important as concerns have been raised about vegetation management and measures that must be taken to restore a more 'natural' condition in some areas of the park. Managers may be ale to use elements of the adaptive management cycle as they explore the possibility of active vegetation management. Plans are also underway to develop a management plan for the park that may help to define management objectives and how the park can deal with its vegetation issues while preserving the wilderness experience.

Managers in William A. Switzer Provincial Park face an almost opposite situation to Willmore in that they have a smaller park ecosystem and many more visitors. Yet the managers of Switzer have taken a similar approach to management by consistently following a passive adaptive approach. There is not much effort made in trying to identify many management options because the park is fairly small and managers are less concerned with ecosystem management than they are with enhancing the experience of visitors. Managers in Switzer have more opportunity than Willmore managers to monitor the results of their decisions because they are close to the resource and are able to observe the effects of their actions. This qualifies more as a type of passive adaptive management than the reactive approach found in Willmore. This system has worked well because Switzer, like Willmore, does not have the resources or the desire to implement a rigorous, active adaptive management. Switzer is able to use some of the resources of surrounding agencies to help manage their park. Managers are in the process of writing a management plan to help clarify the goals and vision for the park.

One particular strength of the management regime in Switzer that could benefit managers in Jasper is the high degree of local control. In Switzer, the level of decision-making is much to closer to the park than in Jasper. Employees in the park have a policy framework in which to work, but they enjoy less political influence in management choices. Managers are still held accountable for their actions but they are free to operate in a manner that the local team sees fit. Therefore, local managers are able to be flexible and adaptive to situations that arise. However it must be noted that the there are far fewer demands placed on Switzer managers than in Jasper because the park is not nearly as heavily visited nor is its basic meaning so heavily contested.

Through most of its history, Jasper National Park was a reactive organization as park managers did not look at extensive options when designing plans nor did they monitor their actions. The legislation and policy framework was not carefully defined and individuals within the agency often interpreted policy to suit their interests and goals. Parks Canada did not look beyond their boundaries to external influences on the park nor did they try to consult with surrounding management districts. In the early years of parks, this was not problematic because there were few demands on the park system. A situation similar to that of Willmore or Switzer existed where there were few people contesting the meanings of protected areas. Park management was solidly grounded in a philosophy of attracting tourists and considered very little else. The business community consequently developed a strong domination over policy planning, a situation that persisted for many years.

With the dawning of the environmental movement and advances in ecological knowledge, Parks Canada began moving to a more ecosystem and adaptive approach to management. This became necessary because social and environmental pressures were intensifying and more people were competing for an increasingly scarce resource. The transition to a more adaptive management has been slow to happen because the development attitude was firmly ingrained in the organization and people still had the power to change policy. Efforts have been made to clarify the purpose of the park and what the management objectives are. Changes such as the introduction of the Canadian

Environmental Assessment Act have helped to make managers more accountable for their actions. The organization looks for new options by consulting the public and other agencies more frequently. Jasper may stand as an example for managers in Switzer and Willmore as those parks become more heavily used. Jasper managers are trying to incorporate more long-range thinking into their planning and connect elements of their research planning. The history of Jasper has also shown how it is important to consider a diverse range of public opinion and not to become captured by one interest group. A park must be able to maintain a sense of its overall purpose while trying to consider the views of all its constituents.

The history of these protected areas has shown that there are many challenges to adaptive management. One of the most basic concerns is debate over the dual mandate of use versus preservation. To manage adaptively it is necessary to have achievable goals and objectives for which management options can be defined. The competition over the meanings of parks has at times been so dominant that designing goals and objectives has been difficult. Adaptive management itself may offer hope in resolving some of the uncertainty in management choices by bringing together stakeholders and designing a range of options in a collaborative effort. Disagreement over the meaning of parks is inevitable and may at times slow the process of rapid feedback and adjustment. Another significant challenge arises when the policy and legislation framework is not adequately structured to give managers the tools they require. If policies are not directed by a park vision and do not have mechanisms that put responsibility on managers, they will be less effective. Managers must be accountable for decisions they make but also have a defined structure within which to work.

Political posturing from the different levels of an organization can be a severe impediment to adaptive management. In the past, parks have been used as political issues by members of federal and provincial governments to make statements about the party's platform. The number of political levels in park's organizations has been shown to contribute to the process of bureaucratic slippage. There are also examples of individuals within the organization exercising excessive power over their position and guiding management to meet their own goals. Finally, adaptive management is impaired when one group dominates the policy agenda, cutting off access to decision-making by other groups and limiting policy options. Agency capture restricts the flow of information and will prohibit the organization from fulfilling its mandate.

6.3. Policy Recommendations

This section will present some suggestions to enhance adaptive management, particularly in protected areas. No comprehensive list of recommendations will be provided here for each management group in the Foothills Model Forest to follow. Rather, this section will examine strategies for improving flexibility in an organization that could be used by any resource management agency. The suggestions are based on the experiences of Jasper, Switzer and Willmore.

A powerful lesson learned in Jasper is that while the dual mandate debate will never be solved, it is useful if a protected areas agency can establish a set of management objectives. Adaptive management is difficult to achieve if there is no clear focus on which to base subsequent management actions. Managers must remember that the meanings of protected areas will always be contested but they must strive to achieve a socially acceptable vision. For example, Canadians may feel that parks should be for preservation and not development yet within this framework there may be strongly opposed factions of how this should be achieved. The organization responsible for managing parks must seek a vision for what the park system will represent based on direction from the legislation, public input, and park managers. Societal values can be assessed through public opinion polling, open houses, focus groups and interest group participation. The agency must realize that this vision may evolve as social and environmental values change. However, the management actions of an organization like Parks Canada must reflect the vision the majority of Canadians have of their parks, and not yield to the pressures of one strong interest group or party politics.

Without proper tools for management, it will be impossible for managers to function within the agreed upon vision for their park. Often legislation and policy is not worded in a fashion that provides clear direction for how management should proceed. This situation exists because it gives managers some flexibility to adapt to issues that arise over time. It would be impossible to practice adaptive management if a manager must follow a rigid course of action. Unfortunately this flexibility has also permitted interpretation of policy by individuals who choose to steer parks management in their own favor. It may also leave managers unaccountable for their actions and not commit them to seeking review of their decisions. Initiatives like the CEAC legislation are effective tools to deal with this issue. This process requires managers to follow a certain course of action but does not restrict their options for research. Legislation and policy should be written to provide a clear set of objectives based on the results of the visioning process. For example, in a place like Switzer this may mean creating a management plan that presents a set of goals for handling human-wildlife conflicts. The managers could take these goals and design strategies that are in accordance with what the legislation deems acceptable practice for the park.

With a defined set of objectives, park managers must be open to seeking new options for future management directions. This is one of the key steps in the adaptive management cycle because it sets the stage for subsequent monitoring and feedback. New options can come from a host of different sources such as the public, other resource management agencies, different government agencies, special interest groups, and from the park employees. Managers in Willmore and Switzer, for example, may find new options for management by actively seeking public input. This could be done through formal advisory boards where citizens meet on a regular basis with park officials to discuss park issues. More frequent public consultation could also serve to reduce conflict and uncertainty among different stakeholders. Adjacent resource management agencies should also be consulted when seeking management options as they may share similar concerns.

The protected areas agency must also look within the organization for suggestions on how to improve management. Too often, in a park such as Jasper, the views of people such as wardens who work intimately with the resources are not included in decision-making. The experience of Switzer shows how valuable local managers are to defining how a park could be managed. Parks Canada would also benefit from hiring employees from more diverse backgrounds. Currently most managers and wardens posses training in the physical and biological sciences while few have social science backgrounds. New options and ideas could be uncovered if there were more skilled employees who represent a diversity of interests. This would also help to reduce the chance of an epistemic community forming that gets locked in one mindset of management. An additional way to increase the range of management options is to divert more park funding into research. Many wardens complained that in Jasper there are insufficient funds to understand what issues must be addressed, let alone to monitor the impacts of management decisions.

After options have been identified, management decisions must be made. One effective way to accomplish this is through a team management approach. The ecosystem secretariat in Jasper helps to fulfill this role by coordinating research efforts and informing management decisions. A team approach may also help to reduce a persistent problem in Parks Canada; the switching of a department's focus each time a new employee takes over a position. If an employee must report to a team structure they will be less likely to take decisions in a completely different direction. This problem could also be addressed by defining more formally the role of each position. Reviews could then be done of each employee to ensure that they are following their mandate.

One of the great advantages of managing a small protected area is the local autonomy enjoyed by park officials. In Switzer Provincial Park, managers do not take every decision to higher levels of the bureaucracy for approval. They are able to make changes in policy based on their firsthand experience with the resource they manage. This approach could help managers in the national parks as well. The legislation and policy for protected areas should allow for decision-making to be performed as close to the park as possible. If there are broadly defined agency goals it should not be difficult to ensure that management across the network maintains a high standard. For Parks Canada this would mean a scaling back of the regional office in Calgary and less influence from Ottawa. This would also serve to build trust with local organizations as the public in Jasper feel more confident when decisions come from the superintendent or others within the park. It would still be important for adjacent parks such Banff, Jasper, Yoho, and Kootenay to maintain communication in order that they might consider the larger ecosystem but this could be done on a more consultative basis.

An organization like the Foothills Model Forest can be an excellent forum for the exchange of information and ideas. The different agencies can coordinate research and monitoring efforts while broadening their scope of management. This structure can help to reduce inefficiencies by sharing overlapping services and reducing the costs to any one agency. This type of organization would be useful in a region that had no similar medium for agency collaboration. Partners in a Model Forest type structure must be willing to participate in a group process and try to implement changes that arise from the group's research. For example, in the FMF, more effort could be made in establishing monitoring and feedback directly into management action. There are great opportunities to observe changes on the landscape resulting from management actions from a host of different industries.

6.4. Future Research

There are a number of avenues that future research could follow to improve the understanding of adaptive management. This study took a broad historical look at three protected areas but did not focus intensely on one. Therefore future research could investigate more closely the management of each of these areas, or one period of time more closely. There is also opportunity to examine adaptive management in other regions as the results here may not reflect the reality of other jurisdictions.

Within the Model Forest protected areas, the most interesting possibility for future work may be to examine some of the specific ways in which power is exercised by each of the organizations. Throughout the data collection period, it was apparent that the political workings of Parks Canada in particular were quite complicated. Many of those interviewed spoke about sudden changes in policy, decisions coming from outside the park, and major changes happening without any prior public knowledge. This thesis did not cover in depth the channels of power in the organization or how the system has at times been manipulated. A study that examined these issues would likely have to expand the study area to include both the regional office in Calgary and the Parks Canada headquarters in Ottawa.

Future studies could expand on this thesis by comparing other management jurisdictions to those covered here. One could investigate if the same types of issues were present in other protected areas networks. It would also be helpful to compare adaptive management of protected areas with other types of resource agencies such as logging, mining, or fisheries. It is likely that other organizations face many of the same barriers but new possibilities may also become apparent. The agencies studied here did not claim to practice adaptive management at any point in their history. It would be useful to study organizations that are attempting to practice adaptive management to see if they are successful and compare the challenges they face. This may also help to identify how different types of adaptive management may be appropriate under different conditions. This study showed that in some cases a reactive adaptive approach may be the most effective route an agency can follow. Future work could examine more closely the variables and situations that affect the type of adaptive management that can be practiced.

It would be insightful to return to these protected areas in several years to revisit management practices. Many changes are occurring in all of these parks at the present time. Management plans will soon be completed in William A. Switzer Provincial Park and Willmore Wilderness Park. Managers of both parks are becoming much more aware of their role in preserving ecological integrity and are striving to more actively manage their resources. Services in Switzer were privatized for the first time this year and the effects on management are still unclear. Jasper National Park is about to launch a new management plan as well with a much stronger ecological focus than in previous years. Parks Canada has very recently been granted full agency status and this will likely change the administration of all the parks. There is a new optimism in Jasper about the agency's commitment and ability to adaptively manage the park. Restudying these areas in several years would reveal if park managers are successful in managing adaptively when they have the tools and the vision needed to perform ecosystem management.

There are also a number of sociological issues that could be further studied. Future work could investigate how the process of bureaucratic slippage is different in an agency with few coercive regulations. Most work on bureaucratic slippage has shown how regulatory agency policy is altered through successive reinterpretation but in a protected area there are few such regulations in place. Also, Jasper National Park presented a unique set of agency-constituent relations that could be compared to other regions. The location of the townsite in the park contributed to the dominance of the business influence on park management. A different set of relationships is predicted to exist when there are no communities within the park and the constituent is the general public. A particularly interesting example to study would be Gros Morne National Park on the west coast of Newfoundland. Park boundaries were drawn around local communities when the park was created, leaving nodes of inhabited areas surrounded by parkland. The lives of the citizens in these communities were greatly changed by the park yet they do not live under Parks Canada control. Investigating the relationship of these communities to Parks' decision-making would be an interesting topic. There may also be other social factors that could change the practice of management such as the nature and types of interest groups and features within the structure of the managing agency. There is a variety of possible organizational factors that may affect the types of adaptive management that can be practiced in a region.

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APPENDIX 1. INTRODUCTION LETTER

The Evolution of Policy and Adaptive Management in the Foothills Model Forest

A study conducted by:
University of Alberta
Foothills Model Forest

Background: The purpose of this study is to investigate the evolution of policy and management in the Foothills Model Forest. We are interested in the social forces that shaped the development of policy in Jasper National Park, William A. Switzer Provincial Park, Willmore Wilderness Park, and the Yellowhead corridor. To investigate these processes, we are seeking people who have witnessed changes in management and policy to inform us on how these changes occurred. We wish to interview people from different backgrounds involved in the policy process such as government, business, environmental groups, recreation groups, community leaders, and others. We intend to combine interview information with existing documents to assess whether the management structures were adaptive to change. This research may be useful in illuminating the reasons for past management decisions and how current management structures may be improved.

You have been asked to be interviewed because your knowledge is valuable to our research. The interview will likely take less then one hour to complete. All your responses will be kept *strictly confidential*. You will not be identified by name in any written reports nor will your responses be shared with any other individuals. You may choose to not answer any question or to end the interview whenever you wish. The interview may be taped, with your permission, but all tapes will be destroyed following completion of the project. We greatly appreciate your time and insight and are committed to ensuring your comfort and confidentiality. If you have any questions please contact us at the numbers below. If you would like a copy of the final report, they will be available from the Foothills Model Forest or you can contact us for more information. Thank-you for your time.

Investigators:

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CONSENT: I acknowledge that the research procedures described above have been explained to me, and that any questions that I have asked have been answered to my satisfaction. In addition, I know that I may contact the person designated on this form, if I have further questions either now or in the future. I have been assured that personal records relating to this study will be kept confidential. I understand that I am free to withdraw from the study at any time without jeopardy to myself.

____
(Name of Participant)

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(Signature of Investigator)

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(Signature of Participant)

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(Date)